



First Aero Weekly in the World.
 Founder and Editor : STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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EDITORIAL COMMENT.

The R.A.F. and the Private Constructor.

Almost from its very inception the Royal Aircraft Factory has stood as a sort of *bête noir* to the private constructor of aircraft. On the one hand, it has been freely stated that the purpose of those in charge of the Factory is to get the whole of the constructional work for the Army into its own hands and to put the private builder down and out, as the vulgar phrase goes.

On the other side of the picture, the officials have been painted as angels of light, whose one aim in life it is to foster the private industry and to assist by all means in their power to build up a stable industry upon which the country will be able to lean in time of stress. So far as our own attitude towards the Factory is concerned, we have always endeavoured to hold the balance fairly as between it and its critics, leaning neither to the one side nor the other. On occasion we have not hesitated to criticise the policy by which it is directed, particularly with regard to constructional work, neither have we hesitated to fall foul of those who in our judgment were wrong in their facts or criticism of that policy. We would, therefore, have it clearly on record that in what we have to say on this present occasion, we are not in the least actuated by a spirit of hostility to the R.A.F. or towards those in control of its work.

It has come to us through a leading private constructor, whose name we refrain from mentioning, for obvious reasons, that it has been decided to lay down a large number of the new R.E. machines for construction in the R.A.F. solely, and that no orders are to be placed for the type with private firms. Ostensibly, the reason for this is that it is considered desirable that the details of these machines shall be kept secret. On the face of it, this may appear to be a good reason, but on examination we do not think it will appear quite as sufficient as at first sight. First of all, let us go back a little and recall the many statements that have been made by responsible Ministers of the Crown with regard to the R.A.F.

Time and again it has been said, with all possible weight of authority, that the functions of the Factory were to be purely experimental and for the purpose of executing repairs to machines already in commission. In no sense was it to be a competitor of the private firm in constructional work. Yet from time to time it has been alleged that the Factory was more of a constructional works than a repair factory. More, it has been said that one of its principal functions seemed to lie in picking the brains of others, with the ultimate purpose of embodying their ideas in a new type and claiming the credit for originality of thought. Our readers may remember that we challenged this last statement in a most definite and categorical manner, but that no satisfactory reply was ever made to the challenge, with the result that we can only regard that charge as being at least "Not Proven."

We have only referred to this aspect of the relations between Factory and private constructor as incidental to those relations, and to once more bring out the fact that all along there have been the gravest suspicions entertained in many responsible quarters of the *bona fides* of official assurances. It is not our purpose, however, to pass judgment on what has gone before, but rather to seek assurances as to the future.

Now, if official statements as to the functions of the R.A.F. are to be taken to mean anything at all, why is the Factory undertaking the construction of these R.E. machines to the exclusion of the private contractor? (We are assuming, of course, that our informant knows whereof he is talking when he assures us that the position is as he has said.) Either the R.A.F. is out to do constructional work or it is not. We have been assured, not once but many times, that it is not, and yet we receive the sort of

information which is the subject of these remarks! Somehow things do not seem to fit together at all well!

As we have said, the ostensible reason for the departure from the official programme is that it is desirable to keep the details of the R.E. secret. That is only a good reason as far as it goes. Let there be no mistake in this.

We place the Imperial interests of the country as high as anyone, and if it can be shown that those interests clash with those of the aeroplane industry, then we are altogether at one with the authorities in placing them in the forefront, even though it should lead to the virtual wiping out of an industry with which we ourselves are to a great extent allied. But we are not content with the bare statement that the reason is as laid down. It is not as though secret and confidential work was not put out to contract in other directions. What about private ship-

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THE ROYAL FLYING CORPS.

IN the last two issues of FLIGHT we have published an account of the work carried on at the Concentration Camp by the Military Wing of the Royal Flying Corps at Netheravon. Elsewhere in this issue, by way of a record, will be found photographs of the Officers, Warrant Officers, Flight Sergeants and Sergeants of the Aircraft Park, Headquarters Flight, and Nos. 2, 3, 4, 5 and 6 Squadrons of the Royal Flying Corps who were present at the Camp.

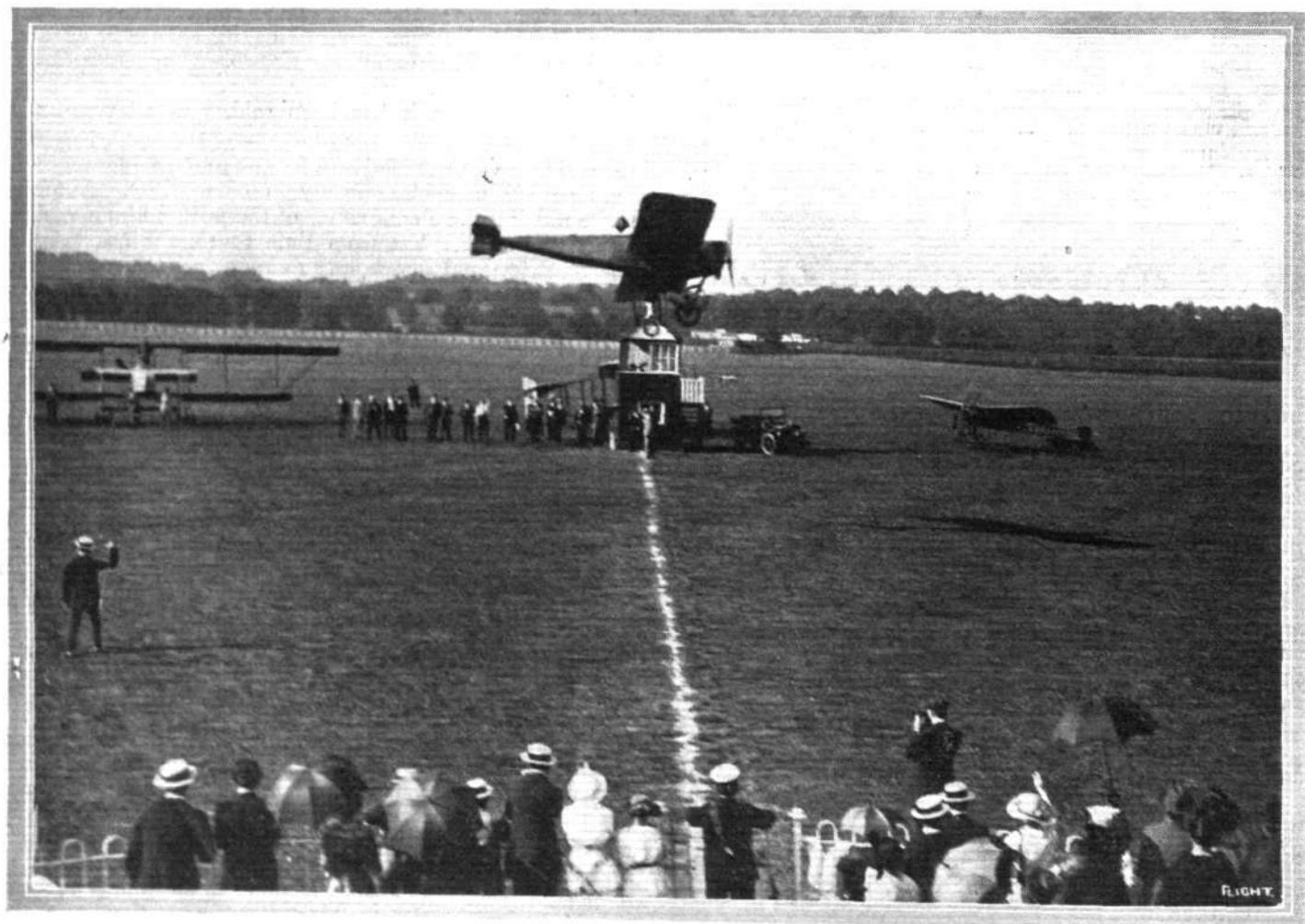
yards, in which work of the most highly confidential character is carried out without injury to the interests of the State? What about the exceedingly delicate documents which are entrusted without a shadow of suspicion or doubt to the King's printers? And is there any reason to think that the privileges accorded to ship-builders, ordnance manufacturers, and printers would be abused by the builders of aircraft? For our own part, we decline to think so and with no desire in the world to be captious—the records of these columns are sufficient index to that—we do think that some official explanation is due.

The facts of the case having been thus made public, we hope that such an explanation will be required across the floor of the House of Commons, and until that has been asked and given—or withheld, as the case may be—we prefer to suspend judgment.

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THE FATAL ACCIDENT TO LEGAGNEUX.

WITH the passing of Legagneux there disappears from French aviation one of its most popular heroes. It appears that on Monday the aviator was testing a Clement-Bayard waterplane above the Loire at Saumur, when just as a sideslip was being corrected the propeller burst and the machine fell into the river. By the time help reached the spot the pilot was dead, and subsequent examination led the doctors to conclude that he was killed while the machine was still in the air, through being thrown against the hood and breaking his neck. Legagneux, who qualified on a Sommer biplane in April, 1910, had also flown Voisin and Farman biplanes and Morane, Blériot, Nieuport and several other monoplanes.

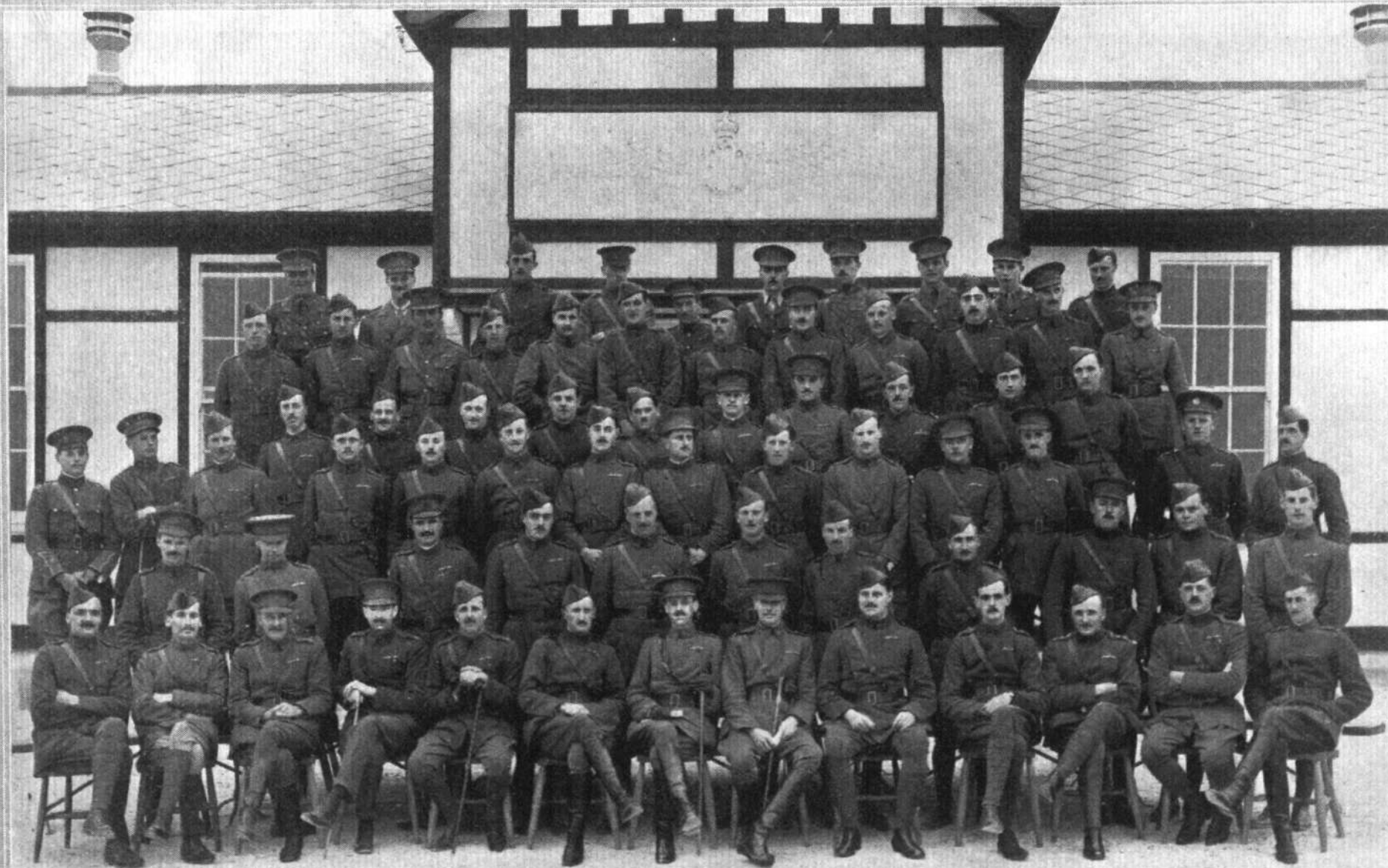


R. H. Carr winning the Cross-Country Race, with Miss Saunders as passenger, on the Morane-Saulnier mono, at Hendon on Saturday.

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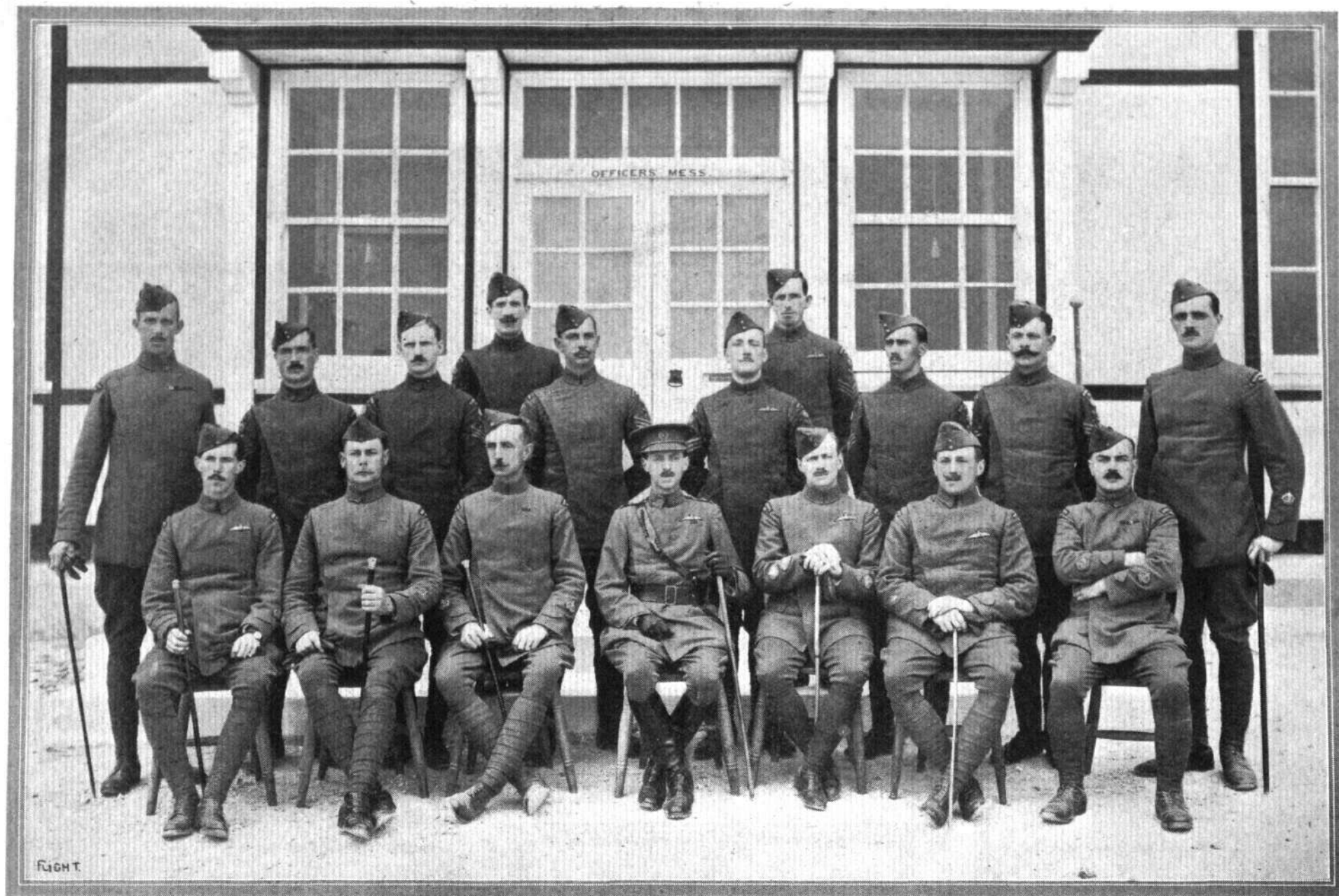
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Photo by Gale and Polden.

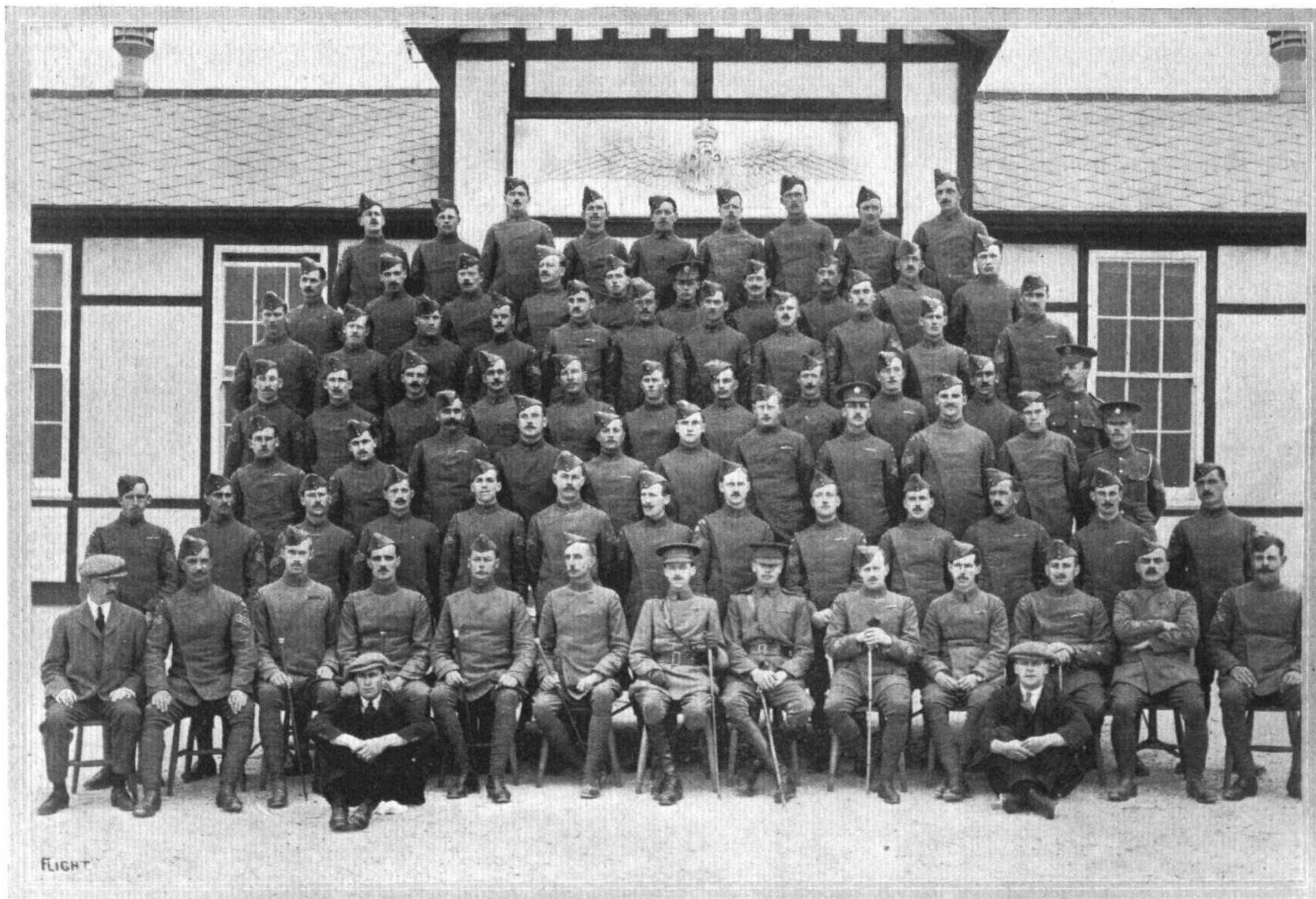
CONCENTRATION CAMP AT NETHERAVON.—Officers of the Royal Flying Corps. (For Key see page 726.)



CONCENTRATION CAMP AT NETHERAVON,—Warrant Officers and Flight Sergeants of the Royal Flying Corps. (For Key, see page 726.)

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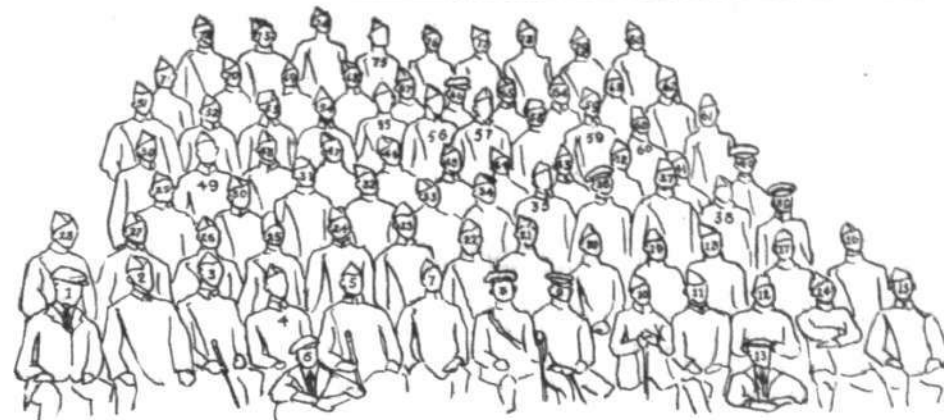
CONCENTRATION CAMP AT NETHERAVON.—Warrant and N.C. Officers of the Royal Flying Corps. (For Key see page 726.)



CONCENTRATION CAMP AT NETHERAVON.—Officers of the Royal Flying Corps: (1) Capt. Beatty, (2) Capt. Dawes, (3) Maj. Brabazon, (4) Maj. Musgrave, (5) Maj. Raleigh, (6) Maj. Higgins, (7) Col. Sykes (Commanding Officer), (8) Lt. B. H. Barrington Kennett (Adjutant), (9) Capt. Conner, (10) Capt. Cholmondeley, (11) Capt. Herbert, (12) Capt. Charlton, (13) Capt. Carmichael, (14) 2nd Lt. Fuller, (15) Lt. Joubert de la Ferte, (16) Lt. Mills, (17) Lt. Hynes, (18) Capt. Waldron, (19) Capt. Todd, (20) Capt. Beor (Camp Commdt.), (21) Capt. Stopford, (22) Capt. Grev, (23) Capt. Shephard, (24) Capt. Holt, (25) Lt. Smith, (26) Lt. Christie, (27) 2nd Lt. Stodart, (28) Lt. Penn-Gaskell, (29) Lt. Redwell, (30) Lt. Dawes, (31) Lt. James, (32) Lt. Martyn, (33) Lt. Spence, (34) Lt. Vaughan, (35) Lt. Mansfield, (36) Lt. Roche, (37) 2nd Lt. Humphreys, (38) Lt. Read, (39) Lt. Gould, (40) Lt. Adams, (41) Lt. Mitchell, (42) Lt. Burton, (43) Lt. Cogan, (44) Lt. Corballis, (45) Lt. Small, (46) Lt. Mapplebeck, (47) Lt. Allen, (48) Hon. Lt. Pryce (Qr.-Mr.), (49) Lt. S. G. Small, (50) Lt. Morgan, (51) Lt. Lewis, (52) 2nd Lt. O'Brien Hubbard, (53) Lt. Playfair, (54) Lt. Porter, (55) 2nd Lt. Wadham, (56) Lt. Noel, (57) Lt. Glanville, (58) Lt. MacNeece, (59) Lt. Freeman, (60) Lt. Harvey Kelly, (61) attached, (62) Mr. Carpenter, (63) Lt. Shekelton, (64) Lt. Atkinson, (65) 2nd Lt. Hartree, (66) attached, (67) Lt. Hosking, (68) Lt. Waterfall, (69) Lt. Lywood, (70) Lt. Hordern.



CONCENTRATION CAMP AT NETHERAVON.—Warrant Officers and Flight Sergeants: (1) Sgt.-Maj. Wilford, (2) F. Sgt. Lacy, (3) F. Sgt. Brockbank, (4) F. Sgt. Hilliar, (5) F. Sgt. Jillings, (6) F. Sgt. Bruce, (7) F. Sgt. Ridd, (8) F. Sgt. Carter, (9) F. Sgt. Nicholls, (10) Sgt.-Maj. Unwin, (11) Sgt.-Maj. Thomas, (12) Sgt.-Maj. Parker, (13) Sgt.-Maj. Ramsey, (14) Col. Sykes (Commanding Officer), (15) Sgt.-Maj. Fletcher, (16) Sgt.-Maj. Measures, (17) Sgt.-Maj. Starling.



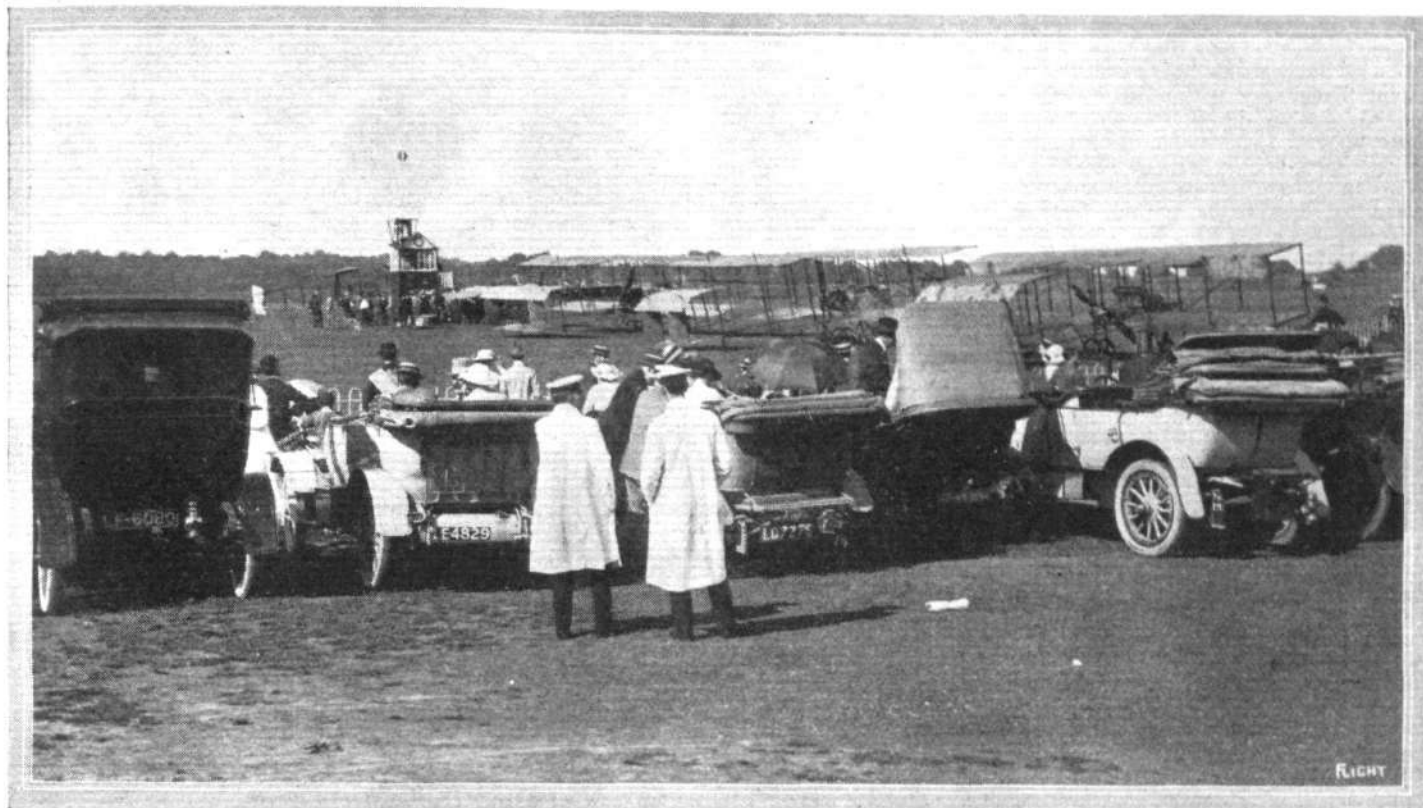
CONCENTRATION CAMP AT NETHERAVON.—Warrant and N.C.O.s. of the Royal Flying Corps: (1) Lg. Art. McKenna, (2) F. Sgt. Jillings, (3) Sgt.-Maj. Wilford, (4) Sgt.-Maj. Unwin, (5) Sgt.-Maj. Parker, (6) Lg. Art. Powell, (7) Sgt.-Maj. Ramsey, (8) Col. Sykes (Commanding Officer), (9) Lt. Barrington Kennett (Adjutant), (10) Sgt.-Maj. Fletcher, (11) Sgt.-Maj. Thomas, (12) Sgt.-Maj. Measures, (13) Lg. Art. Beeby, (14) Sgt.-Maj. Starling, (15) F. Sgt. Nichols, (16) F. Sgt. Long, (17) Sgt. Mullen, (18) Sgt. Mitchell, (19) Sgt. Saywood, (20) F. Sgt. Bruce, (21) F. Sgt. Brockbank, (22) F. Sgt. Hilliar, (23) Sgt. Bullen, (24) Sgt. Hudson, (25) Sgt. Baxter, (26) Sgt. Bullock, (27) F. Sgt. Carter, (28) F. Sgt. Ridd, (29) Sgt. McCudden, (30) Sgt. Traill, (31) Sgt. Street, (32) Sgt. Methery, (33) Sgt. Kemper, (34) Sgt. Keszler, (35) Sgt. Waddington, (36) Sgt. Bateman, (37) Sgt. Ellard, (38) Sgt. Valsey, (39) Sgt. Miles (A.S.C.), (40) S. Sgt. Smith (R.E.), (41) Sgt. Edwards, (42) Sgt. Porter, (43) Sgt. Page, (44) Sgt. Baughan, (45) Sgt. Little, (46) Sgt. Smith, (47) Sgt. Cullen, (48) Sgt. Felstead, (49) Sgt. Cox, (50) Sgt. Mottram, (51) Sgt. Fulton, (52) Sgt. Bullock, (53) Sgt. Tindale, (54) Sgt. Barnes, (55) Sgt. Farrer, (56) Sgt. Aspinall, (57) Sgt. Laws, (58) Sgt. Petch, (59) Sgt. King, (60) Sgt. Hargreaves, (61) Sgt. Patterson, (62) Sgt. Archbold, (63) Sgt. Goodchild, (64) Sgt. Slade, (65) Sgt. McCarthy, (66) Sgt. Sedger, (67) Sgt. O'Reilly, (68) Sgt. McAvoy, (69) Sgt. Taylor, (70) Sgt. Spencer, (71) Sgt. Hughes, (72) Sgt. Millett, (73) Sgt. Grow, (74) Sgt. Angell, (75) Sgt. James, (76) Sgt. Breeding, (77) Sgt. Hoffman, (78) Sgt. Hayward, (79) Sgt. Campbell, (80) Sgt. Jones.

Key plans to the photographs of the Officers of the Royal Flying Corps appearing on page 723, the Warrant Officers and Flight Sergeants on page 724, and the Warrant and N.C.O.s. (on page 725) of the Royal Flying Corps.

JULY 10, 1914.

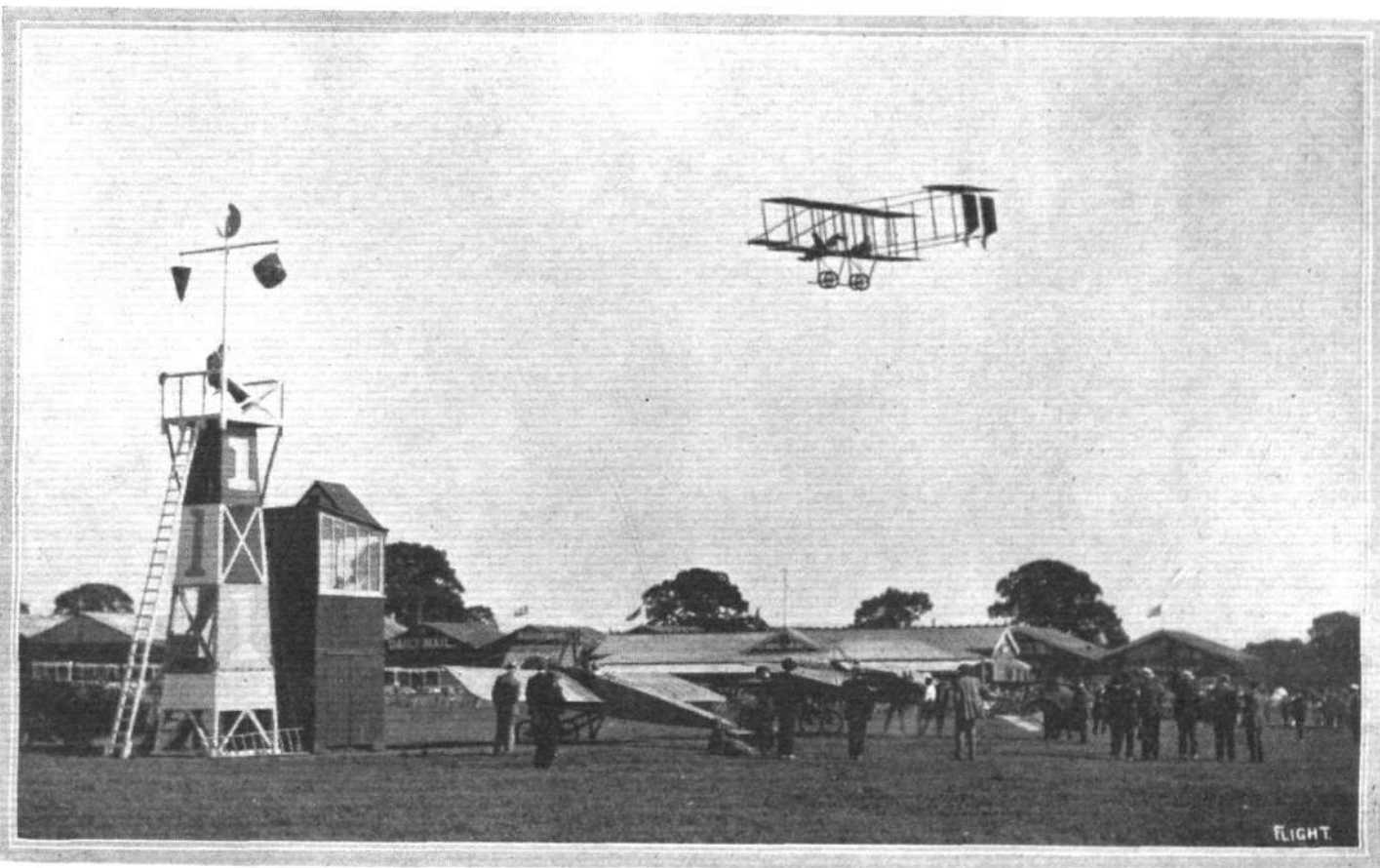
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CROSS-COUNTRY RACE AT HENDON.



The start for the Cross-Country Race at Hendon on Saturday.

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R. J. Lillywhite, on the bi-rudder G.-W. 'bus, completing his first lap and passing over two machines still waiting to start in the Cross-Country Handicap at Hendon on Saturday.

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FLYING AT HENDON.

THE flying on Thursday afternoon of last week started with an exhibition by W. Birchenough on the 70 h.p. Maurice Farman, R. J. Lillywhite following shortly after on the 50 h.p. G.-W. bi-rudder 'bus. Louis Noel then took over the Maurice Farman as soon as Birchenough had completed his flight, and put up some stunt flying, after which Birchenough resumed control and took up the first of the afternoon's consignment of passengers. The next up were J. L. Hall on his 50 h.p. Avro, and A. E. Barrs with a passenger on the 80 h.p. Blériot. Shortly after, Noel, R. H. Carr and Pierre Verrier each took up a passenger on the G.-W. Maurice Farman, the 80 h.p. Blériot, and the Aircraft-Maurice Farman respectively. Noel took up another passenger on the Maurice Farman a little later on, after which Carr gave a looping demonstration on the 50 h.p. G.-W. tractor biplane "Lizzie," making two loops each at an altitude of about 1,000 ft. N. Howarth then made a flight on the bi-rudder 'bus, and Lillywhite took up a passenger on the Blériot before the proceedings were brought to a close.

Before the "Ladies' Day" meeting opened last Saturday afternoon, the "inhabitants" of the aerodrome were treated in the morning to a private display of looping by B. C. Hucks on his new 50 h.p. Blériot. After executing a number of exceedingly clean

overhauled by Carr, who crossed the line three seconds ahead. Verrier was close behind Lillywhite at the end of the third lap, but engine trouble then developed and he had to descend. Noel came in third 20 seconds after Lillywhite, and Birchenough followed fourth some way behind. Immediately after the race the competitors foregathered in the committee enclosure, where the trophies were presented to the winners. After this Lillywhite and Birchenough each took up a passenger on the bi-rudder 'bus and the Maurice Farman respectively, whilst Bjorklund made an altitude flight on his 50 h.p. Blériot, reaching a height of about 3,000 ft. Another passenger was then taken up by Lillywhite, and Carr gave a looping demonstration on the 50 h.p. G.-W. tractor biplane "Lizzie." Louis Noel then took up Mr. E. J. Gollidge, the head-master of St. John's School, Ealing, one of whose pupils won the Grahame-White scholarship. Lillywhite and Verrier also took up passengers on the bi-rudder 'bus and Maurice Farman respectively. Noel next took up Mrs. J. B. Manio and Master Sidney Tompkins—the winner of the scholarship previously referred to—on the Maurice Farman, the young aviator-to-be sitting on Mrs. Manio's knee. After this Noel took up two of the three other boys of the St. John's School who won prizes in connection with the scholarship, both managing to squeeze into the seat, and immediately



THE GRAHAME-WHITE SCHOLARSHIP AT HENDON.—Mr. E. J. Gollidge (Master of St. John's School, Ealing), Louis Noel, Mrs. Manio and the four boys who won prizes—the winner of the scholarship, Master Sidney Tompkins, being to the left of Mrs. Manio.

loops he started off for Hurlingham, where he was giving demonstrations. The meeting opened shortly after 3 p.m. with numerous exhibition and passenger flights by W. Birchenough (passenger) on the Maurice Farman, R. J. Lillywhite (passenger) on the G.-W. bi-rudder 'bus, N. Howarth on one of the G.-W. 'buses, Louis Noel on the 80 h.p. Morane-Saulnier, R. H. Carr (passenger) on the same machine, Pierre Verrier (passenger) on the Aircraft-Maurice Farman, and P. Bjorklund on his 50 h.p. Blériot.

The principal event down on the programme was a 16-mile cross-country handicap for three trophies presented by the Women's Aerial League, Messrs. W. Parnell and Co., and Messrs. Mappin and Webb. In this race each machine was to carry a lady passenger, and the course was four laps of the Bittacy Hill circuit. There were five starters, but only four carried a fair passenger, one having to fly the course in miserable solitude. The competitors started as follows: R. J. Lillywhite, solo, on the 50 h.p. G.-W. bi-rudder 'bus (9 mins. 24 secs.); W. Birchenough, with Miss Puddlephatt, on the 70 h.p. Maurice Farman (6 mins. 20 secs.); P. Verrier, with Miss Dorothy Arliss, on the 70 h.p. Maurice Farman (5 mins.); Louis Noel, with Miss Gladys Lightfoot, on the 80 h.p. Blériot (2 mins. 38 secs.); and R. H. Carr, with Miss Saunders on the 80 h.p. Morane-Saulnier (scratch). Lillywhite maintained the lead until the end of the last lap, when he was

after he gave the remaining boy a flight. All four youngsters were highly enthusiastic over their experiences, and were very anxious to become aviators right away. In the meanwhile flights were being made by Hall on his Avro, Lillywhite (passenger) on the bi-rudder 'bus, and Verrier (passenger) on the Maurice Farman, whilst as soon as Noel had finished with his young passengers, Birchenough resumed work on the Maurice Farman with the full-sized article until the proceedings were brought to a close. During the afternoon a bevy of charming ladies were busy vending badges, &c., on behalf of the Women's Aerial League, so that one was reminded of "Wild Rose Day."

Result of 16-Mile Cross-Country Handicap Passenger-Carrying.

	Handicap.	Handicap
	m. s.	m. s.
1. R. H. Carr (80 h.p. Morane-Saulnier mono-plane) ...	scratch	22 32
2. R. J. Lillywhite (50 h.p. G.-W. biplane) ...	9 24	22 35
3. Louis Noel (80 h.p. Blériot monoplane) ...	2 38	22 55
W. Birchenough (70 h.p. M. Farman biplane)	6 20	—
P. Verrier (70 h.p. Maurice Farman biplane)	5 0	retired

On Sunday the weather was dull and showery, but there was a fairly good attendance nevertheless, and plenty of flying. Louis Noel and N. Howarth took up passengers on the 70 h.p. Maurice Farman, whilst A. E. Barrs and R. J. Lillywhite did likewise on the 80 h.p. Blériot. Lillywhite also flew the 50 h.p. G.-W. 'bus, as did R. T. Gates and F. G. Dunn. Carr also gave a looping demonstration during the afternoon, executing two loops and a tail slide.

The Vaudeville Charity Carnival and Aviation Day in aid of the Music Hall Convalescent Home Fund, which took place at Hendon on Tuesday, was a great success. From 1 p.m. till 6.30 p.m. the fun went on without a break, and some of the events were indeed very amusing. Many well-known members of the "Profession" were present, and the attendance and weather were quite good. The proceedings opened with flying displays by the Hendon pilots—Louis Noel and W. Birch-enough on the G.-W. Maurice Farman, R. J. Lillywhite on the G.-W. bi-rudder 'bus, P. Bjorklund on his 50 h.p. Blériot, R. H. Carr on the 50 h.p. G.-W. tractor biplane, "Lizzie," N. Howarth on the G.-W. 'bus, and P. Verrier on the Aircraft-Maurice Farman. Several passengers were also taken up. A running relay race for lady teams from the principal revues, such as "Hullo Tango," "Get 'Away You Boys," "Mam'selle Champagne," &c., then took place. The young ladies, looking quite smart, attired suitably for the event, ran exceedingly well—they were started, by the way, by the official timekeeper, Mr. George Reynolds—and the race resulted in a win for the team from "Hullo Tango," "Fancy Meeting You" being second. In the meanwhile, Verrier took up a passenger on the Maurice Farman, and "Gunboat" Smith put up a couple of rounds of boxing with his coloured sparring partner "Big Bob" Armstrong. The next event was, perhaps, the most exciting race seen at Hendon—a race for four-wheeled cabs. In



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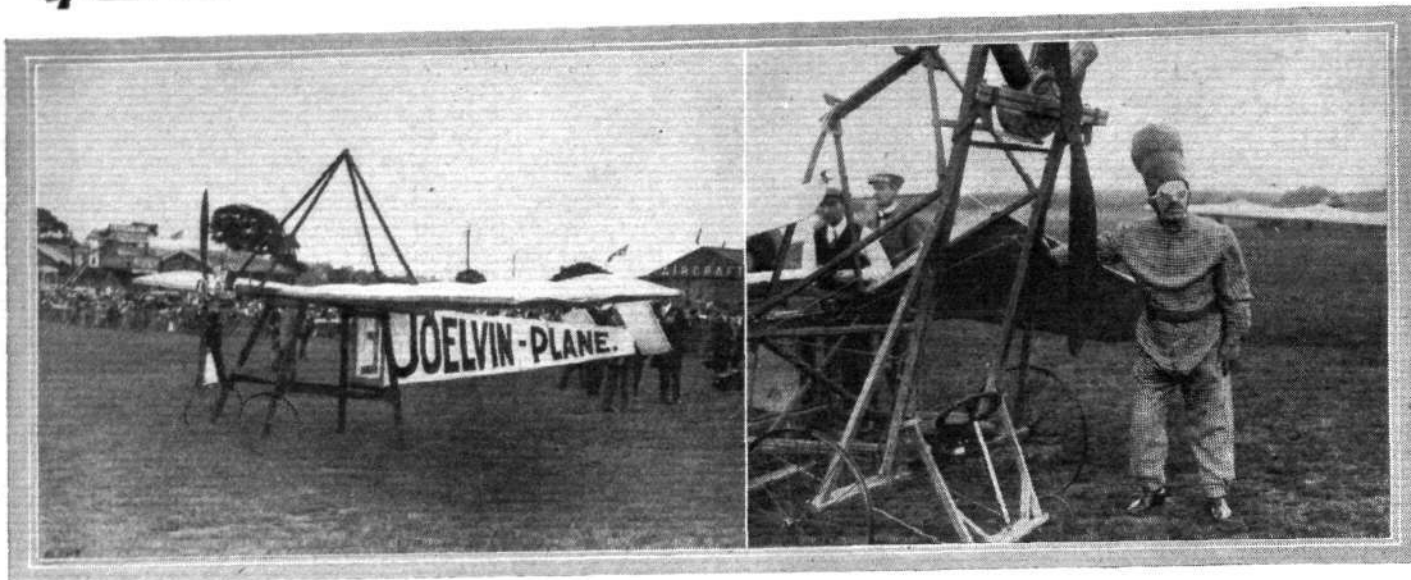
WOMEN'S AERIAL LEAGUE.—One of the sellers of patriotic badges who did a good trade at Hendon Aerodrome.

spite of the fact that it was not necessary to call upon the official hardcappers, the h.p., head resistance and other conditions being equal in each case, the race resulted in a dead heat for two out of four of the competitors, so these two had to race again; this time the winner got in an easy first. Another passenger was then taken up by Verrier, and the "Atlantic" machines, specially designed and constructed by the Grahame-White Co., were brought forth from their hangars. Some of the revue girls started off in a donkey race, one or two of the competitors getting in the other's back-wash, making rather bad landings. A record for Hendon was then put up, when W. L. Brock, R. H. Carr, R. T. Gates and Louis Noel all finished in a dead heat in the "Pilot's donkey race." A start was then made for the Atlantic flight by Harry Tate and Joe Elvin. The former, in a very complete aviator's outfit, started first, the mechanics having duly doped the engine and swung the propeller both ways, but unfortunately the machine struck a remous or something on starting, for it very completely collapsed. The unfortunate aviator was removed from the debris by the members of the St. John Ambulance Corps. and carried from the ground on one of the wings of his machine. Joe Elvin tried next. At first his engine refused to fire, so a mechanic came to the rescue with a box of matches, and it started with a healthy rattle, something like the sound of a Renault. In order to give the machine a start, several willing hands gave it a push off, but it made a dash for the enclosure, and disaster seemed inevitable until someone saved the situation by pushing the machine over. The third machine, the planes of which were covered with a special non-unflammable fabric, caught fire and was totally destroyed. None of the pilots have yet reached America. Carr then gave a looping display on "Lizzie," making three loops at about 1,000 ft. and finishing up with a fine spiral descent. He received a hearty round of applause on landing.



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THE FOUR LADY PASSENGERS IN THE HENDON CROSS-COUNTRY RACES ON SATURDAY.—Left to right: Misses Saunders, Puddephatt, Gladys Lightfoot and Dorothy Arless.



FUN AT THE MUSIC HALL CONVALESCENT HOME FÊTE AT HENDON.—An Atlantic 'bus and the "pilot," who taxied it for ten yards before it was wrecked.

The next event was a passenger carrying air race (for the Wilkie Bard Cup) in which each pilot had to fly one circuit (with a lady passenger who bore a despatch), at the end of which the passenger alighted and rushed to her partner who received the despatch and ran to the machine, climbed in, and the engine having been started, another circuit completed. The winners were the pilot and passengers completing the course in the fastest time. The first competitor was Lillywhite on the bi-rudder 'bus, his passengers being Misses Ena Cowie and Eva Challis ("Fancy Meeting You" and "While You Wait"). His time was 6 mins. 21 secs. Noel on the Maurice Farman was next, his passengers being Misses L. Horner and V. Lindsey ("Hullo Tango" and "Mam'selle Champagne"). Time, 4 mins. 28 secs. Verrier who was next, on the Maurice Farman, completed his first circuit with Miss Dorothy Ward with a series of switchbacks and zig-zags, whilst with his second passenger, Miss Teddie Gerard, he flew right away outside the aerodrome, returning some time later. Noel, therefore, was the winner. In the next event, a 220 yds. running race for pilots, in which the following competed:—W. Brock, G. W. Beatty, A. E. Barrs, F. G. Dunn, R. T. Gates, N. Howarth, R. J. Lillywhite, Louis Noel, M. Ossipenko, and C. Weber, Brock and Noel finished in a dead heat, and so ran the race over again together. This time Noel crossed the line first by something in the neighbourhood of $\frac{1}{100}$ th of a sec.—anyway, Mr. Reynolds' watch could not record it. After this a 6-mile air race (4 laps) for the "Performer" Cup, was flown, the starters being R. J. Lillywhite on the bi-rudder 'bus (2 mins. 21 secs.);

Louis Noel on the Maurice Farman (1 min. 6 secs.); P. Verrier on a similar machine (45 secs.); and R. H. Carr on "Lizzie" (scratch). The finish was an exceptionally close one, Noel once again being the winner, with Verrier second, only 3 secs. behind. Lillywhite was third, 5 secs. behind Verrier and 4 secs. in front of Carr. Numerous passengers (mostly members of the "Profession"), were then taken up by Noel and Lillywhite, whilst a display of Japanese daylight fireworks was given by Messrs. J. Pain and Sons.

The proceedings were brought to a close with the presentation of the prizes by Miss Marie Kendall, assisted by Mr. Harry Champion. Prizes:—6-mile Air Race, 1st, "Performer" Cup: Louis Noel. Passenger-carrying Air Race, 1st, "Wilkie Bard" Cup: Louis Noel and Misses L. Horner and V. Lindsey. Pilots' Running Race, 1st (suit case): Louis Noel; 2nd, W. L. Brock. Mechanics' Running race, 1st: H. Carpenter. Other prizes were for Ladies' Relay Race and for largest amount of money collected during the afternoon.

The following are some of the principal forthcoming events at Hendon. On Saturday, July 18th, the July meeting will be held, and on Saturday, July 25th, the Blériot meeting will be held in honour of the fifth anniversary of the first cross-Channel flight by Louis Blériot. Special flying displays will be given on Thursdays, July 16th and 23rd, the principal event on the latter date being a biplane speed contest. The Ninth London Aviation Meeting commences on Saturday, August 1st, and ends on Bank Holiday, August 3rd.



FUN AT THE MUSIC HALL CONVALESCENT HOME FÊTE AT THE LONDON AERODROME.—Hendon pilots try out some new 'airy mounts, with some well-judged landings and spirals. On the left, preparations for preliminary straights during which R. T. Gates objects to Carr doping his 'bus's ear with petrol; and, on the right, Messrs. Brock, Carr, Gates, and Noel, the competitors, after rounding Pylon 1.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Diary of Events.

- July 11 ... International Correspondence Schools Race, London-Paris-London. Hendon Aerodrome.
 July 11 ... Balloon Race. Hurlingham Club, Fulham, S.W.
 Aug. 10-22 *Daily Mail* £5,000 Circuit of Britain Race. Starting from Southampton Water.
 Aug. 22-29 Gordon-Bennett Eliminating Trials. Upavon, Salisbury Plain.
 Sept. 19-28 Gordon-Bennett Aviation Race. Buc, France.

HENDON AERODROME.

Members of the Royal Aero Club are admitted free to the Hendon Aerodrome on presentation of their Club Membership Cards. The Membership Card admits the Member only—motor cars must be paid for.

DAILY MAIL £5,000 CIRCUIT OF BRITAIN RACE.

This Race will be open from 6 a.m. on Monday, August 10th, 1914, the starting place being Southampton Water.

The following are the entries, with the official numbers to be displayed on each aircraft:—

- (1) Sopwith Aviation Co., Ltd. (Pilot: H. G. Hawker.)
- (2) Wm. Beardmore and Co., Ltd. (Pilot: To be nominated.)
- (3) Sopwith Aviation Co., Ltd. (Pilot: C. Howard Pixton.)
- (4) Grahame-White Aviation Co., Ltd. (Pilot: To be nominated.)
- (5) Eastbourne Aviation Co., Ltd. (Pilot: F. B. Fowler.)
- (6) White and Thompson, Ltd. (Pilot: Capt. Ernest C. Bass.)
- (7) A. V. Roe and Co., Ltd. (Pilot: F. P. Raynham.)
- (8) Blackburn Aeroplane Co., Ltd. (Pilot: Sydney Pickles.)
- (9) White and Thompson, Ltd. (Pilot: A. Loftus Bryan.)

The Official Controls have been fixed as follows:—

Southampton (starting place), Ramsgate, Yarmouth, Scarborough, Aberdeen, Fort George, Oban, Kingstown (Dublin), and Falmouth.

Arrangements at Southampton.

The Royal Motor Yacht Club has kindly postponed the moving of the "Enchantress" until Monday evening, August 10th. Members wishing to witness the start of the Race on Monday morning may do so from the "Enchantress." A number of cabins are available for the week-end commencing August 8th, and members wishing to stay on board are requested to apply to the Secretary of the Royal Aero Club at the earliest possible moment.

Controls.

Scarborough.—On Thursday last, Mr. H. E. Perrin visited Scarborough and had a conference with the Mayor and several members of the Corporation regarding the arrangements for the control at Scarborough. The details for the control of the boats in the harbour were discussed, and the following Committee was appointed to take in hand the local arrangements:—The Mayor (Mr. C. C. Graham), Councillor G. W. Tindall, Councillor F. P. Morgan, Mr. R. Cole, Mr. W. E. Nichol, and the Town Clerk (Mr. S. Jones).

Falmouth.—On Saturday, Mr. Perrin visited Falmouth and met the officers of the Royal Cornwall Yacht Club and the Mayor of Falmouth. The alighting place was fixed, and the following Committee was formed to take in hand the local arrangements:—Sir Francis Layland-Barratt, Bart., Commodore, Royal Cornwall Yacht Club; Col. Falkner Brown, Vice-Commodore, Royal Cornwall Yacht Club; Mr. R. R. Appleby, Rear-Commodore, Royal Cornwall Yacht Club; Mr. Claude Foster, Chairman, Royal Cornwall Yacht Club; Mr. Arthur W. Chard, J.P., Mayor of Falmouth; Alderman F. J. Bowles, Superintendent of the Falmouth Dockyard; Capt. E. J. Nicholls, Dock Master; Capt. G. Green, Harbour Master; Mr. R. G. Borne, Local Secretary.

INTERNATIONAL CORRESPONDENCE SCHOOLS RACE. LONDON-PARIS-LONDON.

(Under the Competition Rules of the Royal Aero Club.)

Organised by the Royal Aero Club and the Aero-Club de France.

Starting and finishing at the Hendon Aerodrome, Hendon, N.W.

SATURDAY, JULY 11TH, 1914.

PRIZES.

- Fastest Time...* 1st Prize: £500. Presented by the International Correspondence Schools.
Handicap .. 1st Prize: £300. Presented by the Royal Aero Club. 2nd Prize: £150. Presented by the International Correspondence Schools. 3rd Prize: £50. Presented by the International Correspondence Schools.

List of Competitors with Official Numbers.

1. John Carbery. Bristol Biplane or Morane-Saulnier Monoplane, 80 h.p. Le Rhone.
2. R. Garros. Morane-Saulnier Monoplane, 80 h.p. Le Rhone.
3. A. Piquet. Morane-Saulnier Monoplane, 80 h.p. Le Rhone.
4. Pierre Dacourt. Clement-Bayard Monoplane, 80 h.p. Gnome.
5. A. Parmelin. Deperdussin Monoplane, 80 h.p. monosoupape Gnome.
6. Walter L. Brock. Morane-Saulnier Monoplane, 80 h.p. Gnome.
7. Louis Noel. Morane-Saulnier Monoplane, 80 h.p. Gnome.
8. R. H. Carr. Morane-Saulnier Monoplane, 80 h.p. Gnome.
9. A. Malard. Nieuport Monoplane, 100 h.p. monosoupape Gnome.
10. R. R. Skene. Martinsyde Monoplane, 120 h.p. Austro-Daimler.
11. Maxime Lenoir. Ponnier Monoplane, 80 h.p. Gnome.
12. Eugene Renaux. Maurice Farman Biplane, 120 h.p. Renault.
13. Pierre Verrier. Farman Biplane.
14. Thomas Elder Hearn. Blériot Monoplane, 80 h.p. Gnome.

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Hedges Butler Challenge Cup Race.

Hurlingham, July 11th, 1914, at 3 o'clock.

The Long Distance Balloon Race for the Hedges Butler Challenge Cup will start from Hurlingham Club, Fulham, London, S.W., to-morrow, at 3 o'clock.

The following are the competitors in order of start:

- | Competitor. | Balloon. |
|-----------------------------------|------------------------------|
| 1. A. Mortimer Singer ... | "Planet" (80,000 c.f.). |
| 2. Lionel H. Mander ... | "Meteor" (50,000 c.f.). |
| 3. Lieut.-Col. E. M. Maitland ... | "Pompadour" (50,000 c.f.). |
| 4. Capt. Lionel L. Atherton... | "Thistledown" (12,000 c.f.). |
| 5. John Dunville ... | "Polo" (50,000 c.f.). |
| 6. Mrs. John Dunville ... | "Banshee II" (80,000 c.f.). |

Members will be admitted free to the Hurlingham Club on presentation of their Club Membership Cards.

Langley Memoir on Mechanical Flight.

The Smithsonian Institution of Washington has made the following presentation to the Club Library:—

"Langley Memoir on Mechanical Flight."

166, Piccadilly, W. HAROLD E. PERRIN, Secretary.

FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Eastchurch Flying Grounds.

Naval Flying.—Monday, last week, quite a lot of flying was done, the following machines being up several times during the day:—Nos. 154 D.F.W. Arrow, 152 Short Sociable, 49 and 50 B.E.s., 31 Henry Farman, 43 and 153 Bristol tractors, 66 Short gun machine, 3 Short, 64 Short.

Tuesday, another fine day for flying. 51 Henry Farman, 62 Short, 152 D.F.W. Arrow, 70 Maurice Farman, 49 B.E., 43 Bristol tractor, 152 Short soc. were up several times.

Wednesday, fine. Nos. 43 and 153 Bristol tractor, and 1 and 2 Shorts the only machines up.

Thursday, fine. Nos. 31 Henry Farman, 43 Bristol tractor, 1 and 64 Shorts, 152 Short soc.

Friday, wet morning and fine after. No. 152 Short Sociable only machine out, making a trip to the Isle of Grain and back.

Saturday, fine. Lieut. Spencer Grey, who seems to be quite recovered from his accident, had a flight on No. 152 Short Sociable.

Civilian Flying.—Sunday. Mr. F. McClean had 2 flights on his 70 h.p. Short biplane with a lady passenger.

Brooklands Aerodrome.

On Monday morning, last week, the Blériot, Vickers and Bristol pupils were out, as also Mr. MacGordon on the 80 Sopwith; in the afternoon, Mr. Hawker to Farnborough on the Sopwith "Scout," engine test by mechanics of Lord Edward Grosvenor's waterplane, Mr. Dukinfield Jones on D.F.W. solo and with lady passengers, Mr. Knight on Vickers biplane, and Messrs. Jullerot, Merriam and Stutt on Bristol biplanes. Bristol, Blériot and Vickers pupils at work.

Vickers, Bristol and Blériot pupils out Tuesday morning, circuits by pupils at latter school, Mr. MacGordon on Sopwith 80; in the afternoon, Mr. Barnwell with passenger for a couple of flights on new Vickers gun 'bus, Mr. Dukinfield Jones for several flights on D.F.W., Messrs. Jullerot and Stutt on Bristol biplanes. Too windy for school work.

Wednesday morning, Mr. R. H. Charlesworth passed his *brevet* tests (altitude 650 ft.) in good style on a Bristol biplane, Bristol, Blériot and Vickers pupils out; in the afternoon, Mr. Gower on 50 h.p. Blériot and Mr. MacGordon on 80 h.p. Sopwith.

Mr. Gower on 50 h.p. Blériot, Thursday afternoon, and Mr. Jullerot on Bristol biplane. Too windy for school work.

Friday morning, Blériot, Bristol and Vickers pupils out; in the afternoon another Sopwith "Scout" arrived and two standard 80 h.p. Avro biplanes.

Bristol and Blériot school work Saturday morning; in the afternoon, engine test of Martinsyde, Mr. Hawker on 80 h.p. Sopwith "Scout," Mr. Dukinfield Jones solo and with lady passengers on D.F.W., Mr. Skene on Martinsyde.

Mr. Hawker went up to an altitude of 11,000 ft. and was able to clearly distinguish the Isle of Wight owing to the clearness of the atmosphere.

On Sunday afternoon it was raining on and off all the time and ultimately a downpour set in and lasted until the small hours of Monday morning, but those spectators whose keen interest in aviation impelled them to brave the elements were amply rewarded by witnessing one of the finest exhibitions seen at Brooklands—by Mr. Hucks on his Blériot monoplane, who gave two demonstrations of looping the loop and flying upside down, which evoked the heartiest applause. Fine exhibition flights were also given by Mr. Hawker on the Sopwith scout, Mr. Skene on the Martinsyde, and Mr. Dukinfield Jones on the D.F.W. biplane, on which he took up a number of passengers, including the winner of the ballot for the



Mr. Leonard Parker, who obtained his pilot's certificate at the Bristol Flying School, Brooklands.

free passenger flight, Mr. George Steggles, of 9, Sydenham Road, Guildford. Mr. Hawker will loop the loop with passengers next week.

Blériot School.—Rolling and straights on Penguin and 28 h.p. Anzani-Blériot. A. Crick, 43 mins.; H. O'Hagan, 24 mins.; W. South, 8 mins.; E. L. Pitt, 1 hr. 23 mins.; Lieut. Noott, 8 mins.; Lieut.-Col. Fraser, 30 mins. Circuits and figures of eight on 45 h.p. Anzani-Blériot. H. O'Hagan, 16 mins.; W. South,

38 mins.; Lieut. Noott, 1 hr. 36 mins. E. L. Gower cross-country flights on 50 h.p. Gnome-Blériot.

Bristol School.—Monday, last week, passenger tuition to Mr. Godwin, Mr. Collins (4 flights), Mr. Treloar (1), Capt. Napier (4), Capt. Bernard (2), Lieut. Coles (3), Mr. Rutledge and Mr. Adamson, Solos by Mr. Adamson (4), Mr. Treloar (6), Mr. Charlesworth (5), Mr. Godwin (5), Mr. Rutledge (2).



Mr. J. Wilson who passed for his pilot's certificate at the Vickers School, Brooklands, on June 9th.

Tuesday, passenger tuition to Mr. Treloar (2), Capt. Napier, Capt. Bernard, Lieut. Coles, Mr. Collins, Mr. Rutledge, Lieut. Britten. Solos by Lieut. Coles (3), Lieut. Britten (2), Mr. Rutledge (3), Mr. Godwin (2), Mr. Charlesworth (3), Mr. Treloar (5), Mr. Adamson (3).

Wednesday, passenger tuition to Lieut. Britten (3), Mr. Lucas (2), Mr. Collins and Lieut. Coles. Solos by Lieut. Coles, Mr. Charlesworth (two each) and Mr. Godwin (3). Wind then stopped further tuition.

Thursday, tuition impossible owing to bad weather.

Friday, Mr. Collins as passenger. Mr. Treloar, Mr. Godwin and Lieut. Coles on solos. Further tuition impossible.

Saturday, Mr. Adamson one passenger flight and four solos.

Vickers School.—Monday, last week, with instructor: Lieuts. Clemson, Gillman and Haskins. Capt. Kane and Lieuts. Clemson, Warrand and Gillman solos. Mr. Klingenstein with instructor.

Tuesday, with instructor: Lieuts. Clemson, Haskins and Gillman, and Mr. Klingenstein. Capt. Kane, Lieuts. Clemson and Gillman solos.

Wednesday, with instructor: Lieuts. Haskins, Clemson and Wells (new pupil). Capt. Kane solo.

Friday, Lieut. Clemson with instructor. Capt. Kane solo.

Liverpool Aviation School, Waterloo.

On Wednesday, last week, Osborn Groves was out rolling morning and midday. Saturday, Groves again rolling and did a fine hop but slowed engine too much and pancaked. Damage slight and machine ready by same evening.

Monday last, Melly took up Crean for tuition flight of 9 mins., and Groves put in some very excellent hops of several hundred yards each.

Melly, on Tuesday, took up Miss Danson and Mr. Spillane for cross-country flights of 12 and 9 mins. respectively, and Crean resumed rolling practice after an absence of about six weeks.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Monday, last week, Messrs. Upton, Liu, Wyles, Courtney, Whitehead, Gruning straights with Instructors Howarth, Birchenough and Barrs in passenger seat. Mr. Shepherd solo straights. Mr. Toolis rolling with instructor.

Tuesday, Messrs. Liu, Courtney, Upton, Toolis straights with Instructors Howarth and Lillywhite. Mr. Shepherd solo straights.

Wednesday, Messrs. Wyles, Toolis, Liu, straights with Instructor Howarth in passenger seat. Messrs. Palmer and Shepherd solo straights.

Thursday, Messrs. Toolis, Liu, Courtney, Wyles and Upton straights with Instructors Howarth and Barrs. Shepherd solo straights.

Beatty School.—Monday morning, last week, Messrs. Allen (5), Cheung (15) and Lieut. Browning-Paterson (8) up with Baumann

Desoutter. W. T. Warren 20 minutes flight, reaching to a height of 1,000 ft. R. Desoutter 20 minutes flight, reaching to a height of 1,200 ft. Mrs. Buller two 15 minutes flights, reaching to a height of 600 ft., all on 35 h.p. Caudron biplane. Mr. Abbott getting in a good hour's practice, doing hops and improving.



Mr. A. Maskell, who has secured his R.Ae.C. certificate at the Shoreham Flying School.



Mr. P. H. Maskell, who has recently obtained his *brevet* at the Shoreham Flying School.

on the Gnome-Wright. At afternoon school Messrs. Bentley (16), Cheung (8), Ruffy (3), Allen (5) up with Baumann, and Messrs. Cheung (8) and Browning-Paterson (18) up with Watts on the 40 h.p. Wright. Tuesday, Lieut. Maguire up with Watts for 22 mins., and Messrs. Bentley (23) and Cheung (10) up with Baumann.

Wednesday, Princess Ludwig of Lowenstein-Wertheim (13), Lieut. Maguire (15), Boyesen (17), Cheung (6) and Bentley (47) up with Baumann, and Messrs. Hodgson (12), Allen (10) and Cheung (8) up with Watts. Friday, Mr. Allen (19) and Lieut. Maguire (41) up with Baumann, and Mr. Cheung (10) and Lieut. Browning-Paterson (4) up with Watts.

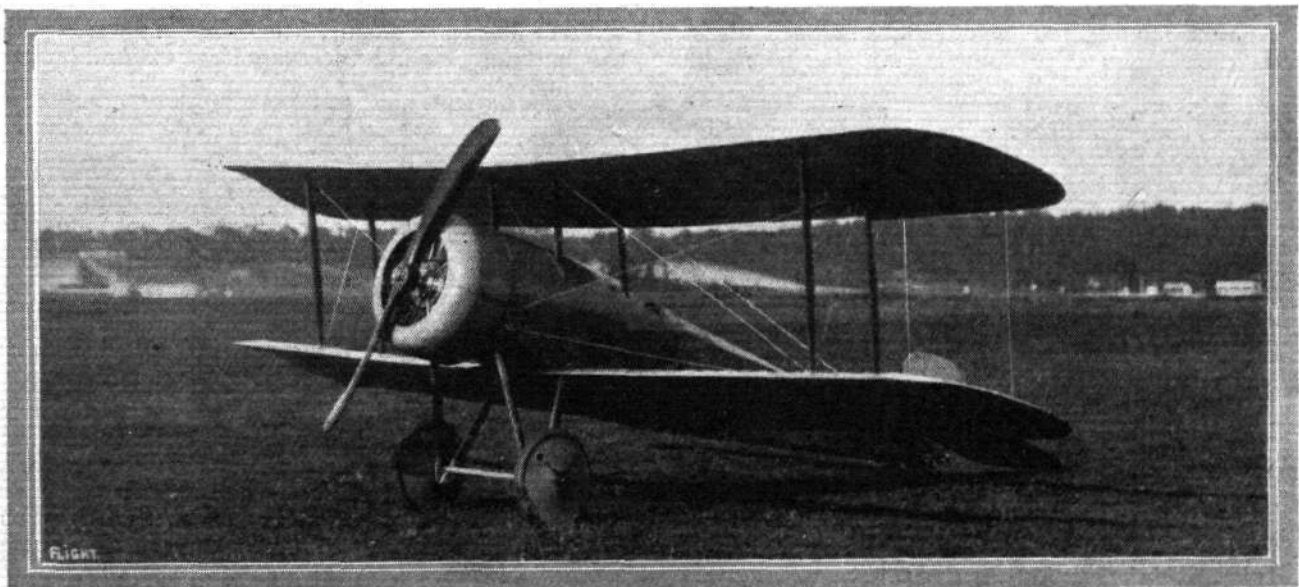
Saturday no school was held owing to the pupils not turning up. During Saturday morning the Handley Page monoplane was tried with its new chassis which appears to be quite ideal for school work.

British Caudron School.—On Monday, last week, school out at 5 o'clock, under the instruction of W. T. Warren and R.

Tuesday, school out at 5 o'clock under instruction of W. T. Warren and R. Desoutter. W. T. Warren ten minutes flight. Mrs. Buller ten minutes flight. Rene Desoutter flight on 60 h.p. Caudron biplane. Mr. Abbott doing straights about 15 ft. up, on machine one hour. Wednesday, school out at 5 o'clock. W. T. Warren two 15 mins. flights, R. Desoutter two flights, one on 60 h.p. Caudron biplane. Mrs. Buller two flights. Mr. Abbott doing good long hops.

Thursday too windy for school to go out. Friday, school out at 5. W. T. Warren test flight. R. Desoutter flight. Mrs. Buller flight. Mr. Abbott doing straights, 16 ft. up. Saturday, too windy.

Hall School.—Monday, last week, Miss D. Clifford on Avro with J. L. Hall 10 minutes. Later, J. L. Hall out testing No. 2 Caudron for pupils. Thursday, windy; J. L. Hall flying high on Avro. Saturday, J. L. Hall out on Avro; exhibitions and passenger carrying. Friday and Sunday pouring with rain.



"Flight" Copyright.

The extremely business-looking 80 h.p. Bristol Scout. Note the method of carrying the shield all round the engine.

LONDON-PARIS-LONDON RACE.

It is the early risers who will witness the start for the London-Paris-London Race from the Hendon Aerodrome to-morrow (Saturday) morning, as the competitors

There are no compulsory stops en route between London and Paris or vice versa, but the competitors after leaving Hendon on the outward journey must



No. 1. Lord Carbery.



No. 2. R. Garros.



No. 4. P. Daucourt.

will leave Hendon in the order of their handicap time, starting with the first man at 6.30 a.m., the others following at ten minutes' intervals up to 8.30. All going well

in order to avoid flying over the thickly-populated West London district, leave the church at Harrow and the Grand Stand on the racecourse at Epsom on their left.



No. 5. M. A. Parmelin.



No. 6. W. L. Brock.



No. 7. L. Noel.

it is anticipated that the winner will arrive back at Hendon, after having completed his course, about 4.30 p.m.

From Epsom the course lies either *via* Folkestone or in a direct line to Boulogne, where the pilots will pass over the harbour, leaving the Napoleon Column, a striking



No. 8. R. H. Carr.



No. 9. M. Mallard.



No. 10. R. R. Skene.



No. 12. E. Renaux.



No. 13. P. Verrier.



No. 14. T. Elder Hearn.

landmark on the outskirts of the town, on their right, and make for Buc Aerodrome, Paris.

Each machine will be restarted from Paris at the expiration of two hours after its arrival, and on the homeward journey the competitors will fly in a direct line leaving Boulogne well on their right, to Folkestone, where they must pass over the quay and Harbour, and return to Hendon *via* Epsom and Harrow, these two points being left to the right. The distance of the double journey is 502 miles, and it is anticipated that the flying time of the winner will be less than 5½ hours. Each pilot will have his official number boldly displayed on the under-side of the wings of his machine and he must pass the controls at Harrow, Epsom, Folkestone and Boulogne at a sufficiently low altitude to enable the figures to be clearly read by the official observers. It is interesting to note that an exemption has been granted by the Home Office, permitting competitors to enter and

leave England without alighting in a prescribed landing area.

An inspection of the table of entrants will show that several of the best known pilots of France and this country are competing so that it is safe to prophesy that some very good performances will be put up.

The cash prizes offered are £500 and a trophy for the pilot who completes the course in the shortest time, presented by the International Correspondence Schools, who are also giving £200 in prizes for the second and third pilots in the sealed handicap. The first prize for the handicap, a sum of £300, has been presented by the members of the Royal Aero Club. When the entry list closed the fourteen pilots and machines had been duly entered as below. The numbers given are the official flying numbers:—

1. Lord Carbery (80 h.p. Bristol biplane). B.
 2. Roland Garros (80 h.p. Morane monoplane). F.
 3. M. Hirth (80 h.p. Morane monoplane). F.
 4. P. Daucourt (80 h.p. Clement-Bayard monoplane). F.
 5. M. A. Parmelin (80 h.p. Deperdussin monoplane). S.
 6. W. L. Brock (80 h.p. Morane monoplane). U.
 7. Louis Noel (80 h.p. Morane monoplane). F.
 8. R. H. Carr (80 h.p. Morane monoplane). B.
 9. M. Mallard (100 h.p. Nieuport monoplane). F.
 10. R. R. Skene (120 h.p. Martinsyde monoplane). B.
 11. M. Lenoir (80 h.p. Ponnier monoplane). F.
 12. E. Renaux (120 h.p. M. Farman biplane). F.
 13. P. Verrier (70 h.p. M. Farman or 80 h.p. H. Farman biplane). F.
 14. T. Elder Hearn (80 h.p. Blériot monoplane). B.
- B. = British. F. = French.
U. = United States. S. = Switzerland.

It will be seen that of the fourteen competitors four represent Great Britain, eight France, one the United States and one Switzerland. There are only three biplanes entered, including a Bristol tractor of the "Scout" type, which, it will be remembered, has the planes staggered and is fitted with *ailerons* instead of warping; the other two are Farman's, one of the M. Farman type having a 120 h.p. engine. Of the 11 monoplanes, five are Morane-Saulniers, three fitted with 80 h.p. Gnome engines and two with 80 h.p. Rhones, which the remaining six monoplanes represent the Blériot, Nieuport, Deperdussin, Ponnier, Clement-Bayard, and Martinsyde types, the last-mentioned, with its 120 h.p. Austro-Daimler engine, being the most powerful.

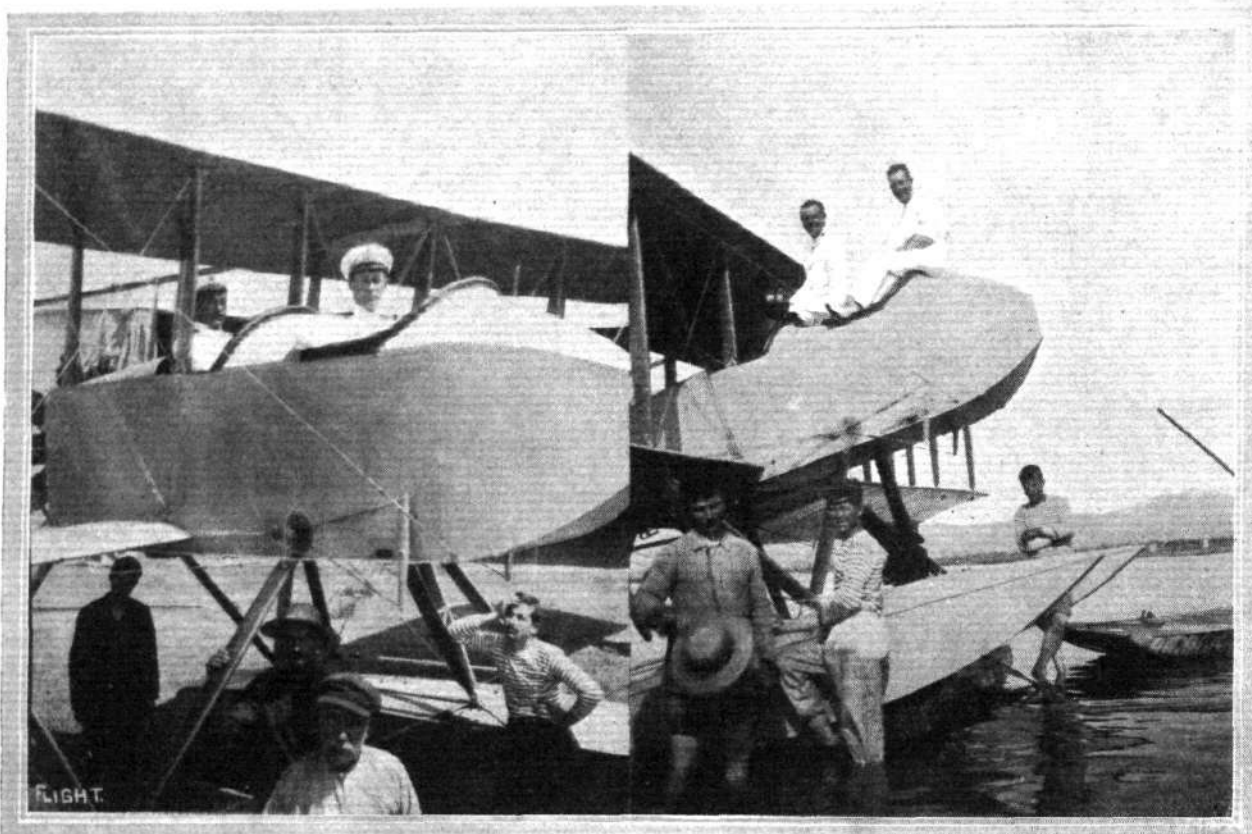
Among those who are taking part in the race who have already flown across the Channel are Lord Carbery, Roland Garros, Louis Noel, Eugene Renaux, Pierre Verrier and T. Elder Hearn, while R. H. Carr has crossed as a passenger with Mr. C. Grahame-White.



EDDIES.

SOME details are to hand regarding the work of Capitaine de Freigate Collyns P. Pizey, who before his appointment to the Marine Royale Hellenique, was so well known to

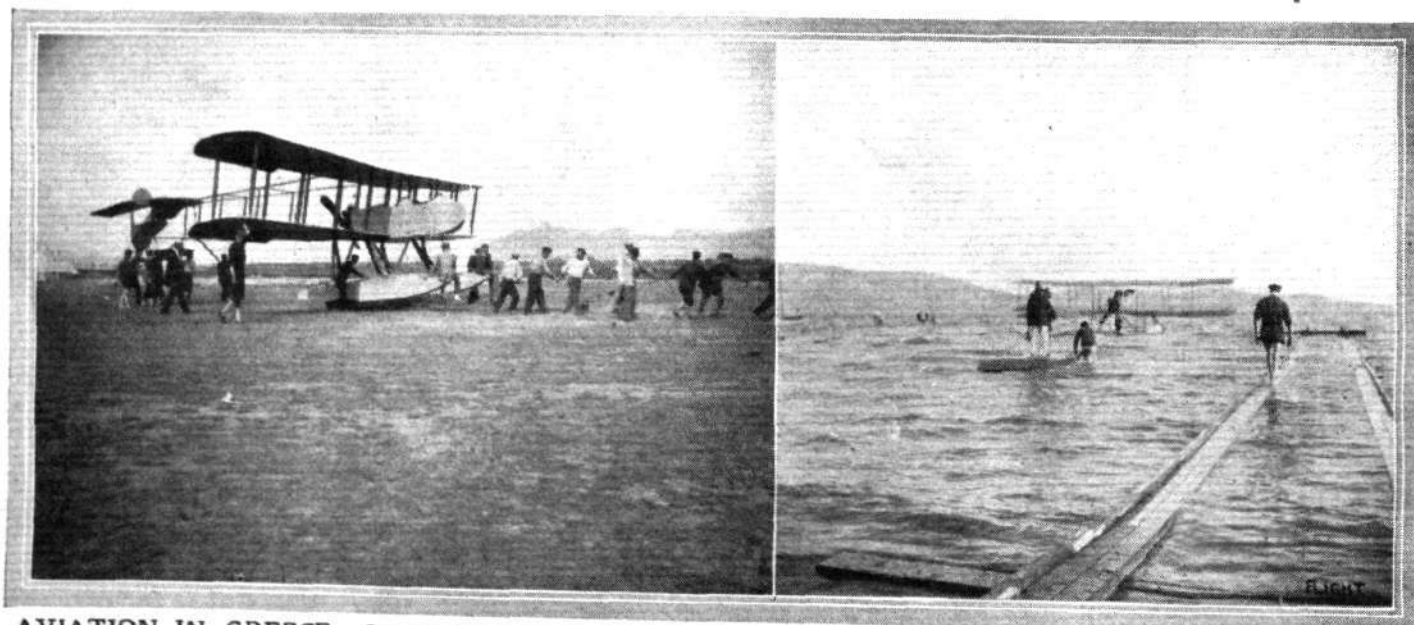
have been trained on it, and they are now ready for solo flights. This is probably the first time that naval officers have been taught to fly directly from the sea without



AVIATION IN GREECE.—On the left Mr. Collyns P. Pizey in the Sopwith "pusher" seaplane with his first pupil, Lieut. Moriatis. On the right, Mr. Pizey and Capt. Leigh, of the British Mission, and pilot of Farman schools.

our readers from his connection with the Bristol Co. A very flattering report is given of the work of the Anzani-engined Sopwith "pusher" seaplane, which in one month was flying for some 40 odd hours. Five Greek officers

first doing land flying. The names of the first five officers to join the corps that Mr. Pizey is organising for the Greek Government are:—Lieut. Moriatis, Lieut. Papagegin, Lieut. Panioton, War. Officer Meletopoulos



AVIATION IN GREECE.—On the left, bringing in the Anzani-engined Sopwith "pusher" seaplane at the Eleusis Air Station after morning flying by Mr. Collyns P. Pizey of the Royal Hellenic Marine Service. On the right Admiral Mark Kerr with Mr. Collyns P. Pizey, punting out on Astra float to the Sopwith seaplane. The man on the slipway is Lapray, one of Mr. Pizey's English "boys."

and War. Officer Courbelis. The conditions under which the school is working are anything but favourable, as there are no sheds or shops, but in spite of that good progress is being made. Some time ago Mr. Pizey made several flights over the British fleet anchored in Phaleron Bay, and among the passengers taken up was Admiral Mark Kerr. In connection with his work Mr. Pizey has the assistance of four keen British "boys"—Lapray, Gaskell, Simms, and Radley—who rank as warrant-officer mechanics.

x x x

The inauguration of the summer season at the Brighton-Shoreham aerodrome is fixed for to-morrow (Saturday), and the programme arranged includes looping by Mr. J. L. Hall and a 24-mile speed race round the aerodrome for the Brighton Cup and a cash prize of £100 put up by the "Shell" Co. On Sunday Mr. Hall will attempt to improve the British altitude record and will also make exhibition flights. Pylons have been placed round the aerodrome marking out a course which is two miles round, and arrangements have also been made for a judge's box and observing stand opposite the main enclosure. Half a dozen new hangars

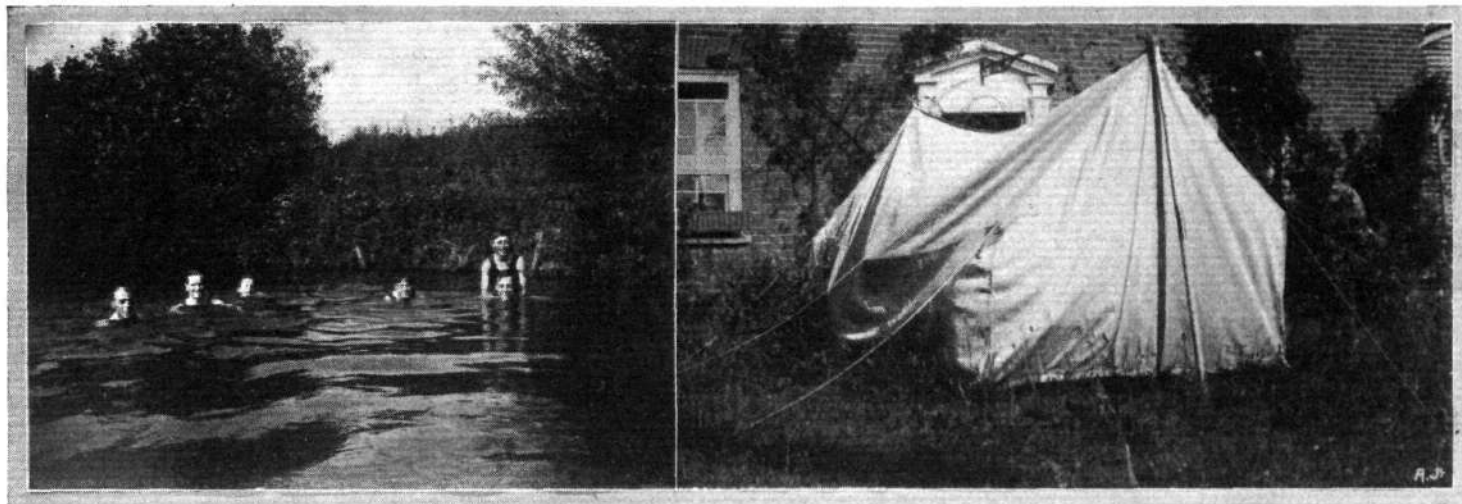
apart, without touching the controls, and with engine stopped the machine came floating down from a height of 1,000 metres, like a dead leaf, the pilot only resuming the controls when a short distance above the ground. The reception accorded him when he landed, needless to say, was extremely enthusiastic, and was intensified during a drive round the enclosures in a motor car.

x x x

I learn from Mr. Pemberton-Billing that "P.B. 7" is progressing rapidly, and that he hopes to have the boat finished in about two weeks' time. It is intended to give this unit an extended trial first as a high speed motor boat, a speed of 40 knots being anticipated. A 130 h.p. Salmson engine is being fitted instead of the Sunbeam for which the boat was originally designed, as Mr. Billing finds that he cannot get delivery of the Sunbeam in time.

x x x

Pupils soon realise, when learning to fly, that in order to take advantage of every suitable moment in the early morning hours, it is advisable to live near to, if not on the aerodrome. As no rooms were available one resourceful pupil at Brooklands has got over the difficulty



A "Wey" the Brooklands' pilots have of trying to dodge the glare of the sun's rays during the hot weather; and on the right the simple life sleeping quarters instituted by one of the pupils at Brooklands.

have been put up, and another six are in course of erection. A bandstand has been put up, and a band has been engaged for each meeting. The comfort of the visitors to the aerodrome has not been overlooked, and seating accommodation on the lawns surrounding the course is being provided, while facilities for refreshments, both on the lawns and in the marquees has been arranged. Such enterprise deserves solid support, and we wish the management a splendid success.

x x x

Evidently Pegoud does not intend to be outflown by his numerous imitators, for on Sunday last at the Blériot aerodrome, Buc, he inaugurated a series of evolutions the like of which had never before been seen. Climbing to 1,000 metres, Pegoud commenced to perform all his old evolutions besides these new ones, such as cart wheels, corkscrews, vertical climbs and upside-down flights with engine stopped, all of which were executed without the use of straps or safety belts of any kind. Pegoud was then seen to leave his seat and climb up on the fuselage of his Blériot whilst holding on to the top pylon and bracing cables. First he stood on one wing then on the other, and finally standing upright with his legs

by pitching his tent behind the hangars and having his meals at the "Bluebird." The coolness of this tent during the recent heat wave was very alluring, but I don't envy him his sleeping quarters when rainstorms are careering around like those experienced in South and West London a little while back.

x x x

A new and very interesting machine is nearing completion at the Grahame-White works at Hendon. It is a small biplane of the tractor type, and possesses several new and original features. The fuselage is somewhat similar to the Morane, and the planes have a very pronounced stagger. The method of strutting is highly ingenious, and only one set of bracing cables is employed on each side. The machine may be expected to make its appearance very shortly.

x x x

I have always been under the impression that the testing of a new machine was a thing to be essayed under the most favourable weather conditions, but evidently this is not always the case, for the other day at Brooklands I watched Mr. Barnwell put a new Vickers gun 'bus through her trials in a wind that would have kept many

a pilot on the ground with an old and tried-out machine. Starting from the Vickers sheds, he took the machine into the air at once without any preliminary straight hops, and immediately commenced a left-hand turn whilst climbing. It seemed a risky thing to do, but I have no doubt that a pilot of such ability as Mr. Barnwell was able to tell if the machine was properly balanced the instant he got her off the ground. He was so pleased with his new mount that after a short rest he was in the air again doing right and left hand turns.

x x x

Mr. A. V. Roe, whom I met at Hendon on Saturday last, told of great doings at the Manchester factory. So much



Fun at the Music Hall Convalescent Home Fête at Hendon.—A close finish between Noel (on right) and Brock when running off their dead-heat in the pilots' sprint race.

work is being done for the Admiralty and Government that the enterprising Avro firm are continually expanding their premises to meet the growing requirements and taking on more men in order to enable the ever-increasing number of orders to be executed; even then, I am told, they find themselves unable to give delivery to the appointed time, and as for carrying out of certain experimental work which Mr. Roe has been contemplating for some considerable time, this is quite out of the question at present. As soon as certain arrangements can be completed, it is intended to transfer the Avro works from Manchester to Southampton.

x x x

In addition to the standard 80 h.p. machines, of which a large number are in the course of construction, the Avro firm are building two large waterplanes for the Navy. One is a 160 h.p. tractor biplane, whilst the other is a large machine of the "pusher" type, measuring 80 ft. across the wing tips. Two Austro-Daimler engines, each of 120 h.p., will drive the two separate propellers situated behind the main planes. The engines are not interconnected in any way, as Mr. Roe contends that it will be possible to fly the machine with one engine running by using the rudder and ailerons.

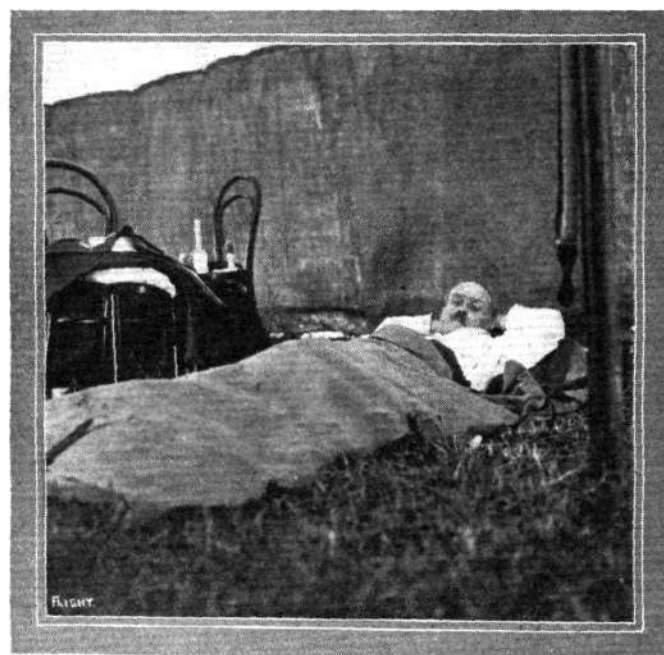
x x x

A visit to Brooklands recently on a rainy day when ordinary school work was out of the question, revealed a

method of teaching flying pupils that I had never previously come across. I found that well-known instructor at the Bristol Flying School, Mr. F. Warren Merriam, busily engaged teaching his pupils a variety of juggling tricks. On enquiring as to the odd behaviour of his pupils I was told by Mr. Merriam that although it might look at first sight as if he were training them for the "Halls," the real secret of the performances was that he had found that a few hours of juggling practice gave the pupil a very keen sense of balance which proved of great benefit later when the flying stage had been reached. Although his methods have not been generally known the results of the Bristol school under Mr. Merriam's management both as to the quantity and quality of the pupils turned out bear good testimony to the success of his system. It should not from this be gathered, however, that Mr. Merriam's success as an instructor is due solely, or even mainly, to his accomplishments as a juggler. Nobody who has seen him handling the school machines can have failed to appreciate his capabilities as a pilot. One of his star turns for which he has quite a reputation, consists in making a spiral from 3,000 ft., with his engine stopped, and landing on a certain mark every time. Less known is the fact that Mr. Merriam is equally skilful in handling the Bristol tractor biplanes and monoplanes, as he has proved on numerous occasions, when the Bristol school at Lark Hill, Salisbury Plain, was in operation.

x x x

Mr. F. P. Raynham, who is giving exhibitions for the *Daily Mail* on his Avro waterplane, is much impressed with the stability of that machine. On numerous occasions Mr. Raynham has let go of the controls for several minutes at a stretch, and has given his entire attention to the taking of photographs. The machine required no manipulation beyond that of steering for the direction in which he wished to go. Stability is not the only good feature possessed by the Avro waterplane,



"REVEILLE."—FLIGHT photographer "in camp" at Netheravon.

however, for when Mr. Raynham was starting out for a flight at Scarborough recently, the waves were very high and the spray was seen frequently to break over the top plane, so that evidently the Avro spring suspension of the floats, as shown at the last Olympia Aero Show, is proving its worth in actual practice. "ÆOLUS."

THE FLYING MACHINE FROM AN ENGINEERING STANDPOINT.

By FREDERICK WILLIAM LANCHESTER, M.Inst.C.E.

(Continued from page 714.)

13. *Acentric Types of Machine.*—The type of machine here suggested would be liable to certain objections on the ground that the line of the propeller thrust is acentric, being situated considerably above the centre of gravity and probably also above the centre of resistance of the machine, conversely the centre of gravity would be considerably below the centre of resistance; these are objections which have been raised with regard to some existing machines. It is undoubtedly desirable, where other considerations permit, to bring the centre of propulsion, centre of resistance, and centre of gravity, to approximately the same level. There is no fundamental difficulty in flying a machine in which this condition is not complied with since any pitching moment that results from the want of concentricity can be corrected by suitably arranging the centre of gravity. Serious difficulty, however, is liable to arise in the event of a sudden change in the mode of flight such as is brought about when the engine is cut out. Under these conditions the machine being propelled in gliding flight by a component of gravity instead of by the propeller thrust, a change of pitching moment takes place equivalent to the total resistance of the machine multiplied by the vertical distance between the line of propulsion and the centre of

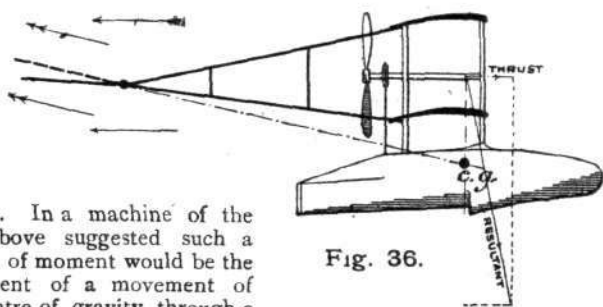


Fig. 36.

gravity. In a machine of the type above suggested such a change of moment would be the equivalent of a movement of the centre of gravity through a distance of nearly two feet, a change which we must regard as of dangerous magnitude.

The position is that shown diagrammatically in Fig. 36, in which it will be seen that the resultant of gravity and the propeller thrust passes some considerable distance in front of the centre of gravity, whereas in gliding flight the resultant of the lifting and propelling forces is the force of gravity, and so passes through the centre of gravity.

It has been suggested that by arranging the tail plane (and elevator) in the wake, in the propeller slip stream, in fact, and giving it an upward rake, in other words, by employing a negatively loaded tail, the tail may be made to supply a countervailing pitching moment when the propeller is at work, thus whilst the direct effect of the propeller is to tend to lift the tail and depress the nose of the machine, the indirect effect brought about by the action of the slip stream on the upturned tail will be the inverse. It might be possible in this way to correct a small want of concentricity of the propeller axis, but such a method would scarcely be applicable to the case in point.

In order that the method in question should be effective, the slip stream must be discharged radially from the centre of gravity of the machine, that is to say, the general body of air discharged in the slip stream must be so deflected that its moment of momentum about the centre of gravity is zero. Roughly speaking, this means that the tail, as shown dotted in Fig. 36, must be set at such an angle as, if produced, would pass through the centre of gravity of the machine; the double-headed arrows show the slip stream diverted as theory requires.

The method is evidently impracticable; not only is the tail angle as necessitated altogether excessive, but also the whole story has not been told—the tail would require to be "feathered" immediately the propeller ceases its function, otherwise it would continue to supply a moment of some magnitude when no longer required.

It is of interest to examine in greater detail the behaviour of a machine such as we are considering under flight conditions. It is clear that if at any instant the engine is switched off two things happen, firstly, as in a machine of the concentric type, the supply of energy being withdrawn the datum of the phugoid chart takes a downward trend, its down slope is that of the gliding angle, Fig. 37, datum 2. Secondly, since the withdrawal of the thrust, reaction is in effect equivalent to a movement backward of the centre of gravity, the angle of attack of the aerofoil is increased and the natural velocity of the machine is reduced, and H_n is diminished

to a corresponding degree. The conditions are thus represented by the upper diagram in Fig. 37; the reduction of H_n being calculated, we consult this has been taken as curve G from Fig. 2. In the lower diagram (Fig. 37) a similar construction has been shown for a machine nearly concentric as to its thrust; the resulting phugoid here corresponds to that labelled C in Fig. 2. The case of least disturbance is that in which the original flight path picks up the new flight path at its point of inflection; this is the case if the propeller axis is slightly below the centre of gravity, since then on cutting out the engine the value of H_n is slightly increased; this is as actually represented on the lower diagram.

At present there are difficulties, of the character and extent outlined, standing in the way of development in the direction indicated. They are difficulties that will without doubt be eventually overcome.

14. *Stability and control.*—In the present lecture all questions of stability in the ordinary sense have been taken for granted. The

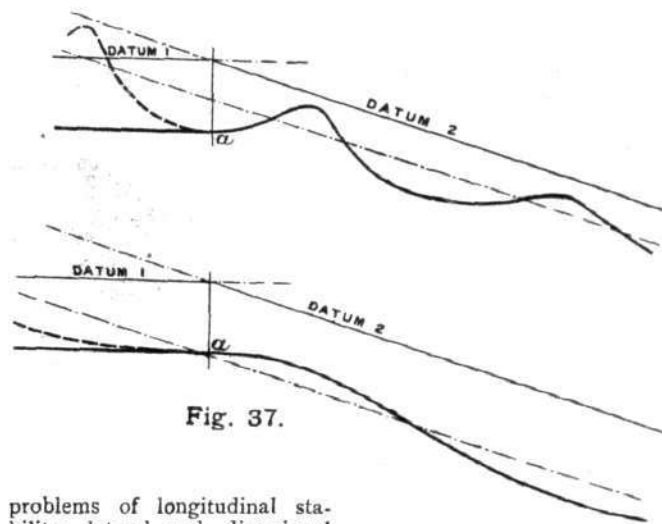


Fig. 37.

problems of longitudinal stability, lateral and directional stability, and spiral or rotative stability, though of vital import to the aeronautical engineer, are primarily matters for the physicist and mathematician; the engineer can well afford to leave questions of this character in the hands of the specialist.

There is perhaps less excuse for the absence of all mention of controlling mechanism, a great deal might be added on that subject without going beyond the scope of the title; however, since the question of control is closely wrapped up with considerations relating to stability, and since it is necessary to draw a line at some point, the omission is one of expediency rather than logic.

The question of stability is not, as is frequently supposed, one that is in any sense obscure; in fact, from the scientific point of view, the present position is at least satisfactory; it can be said without exaggeration that we have a great deal more knowledge on the subject than we are at present able to utilise.

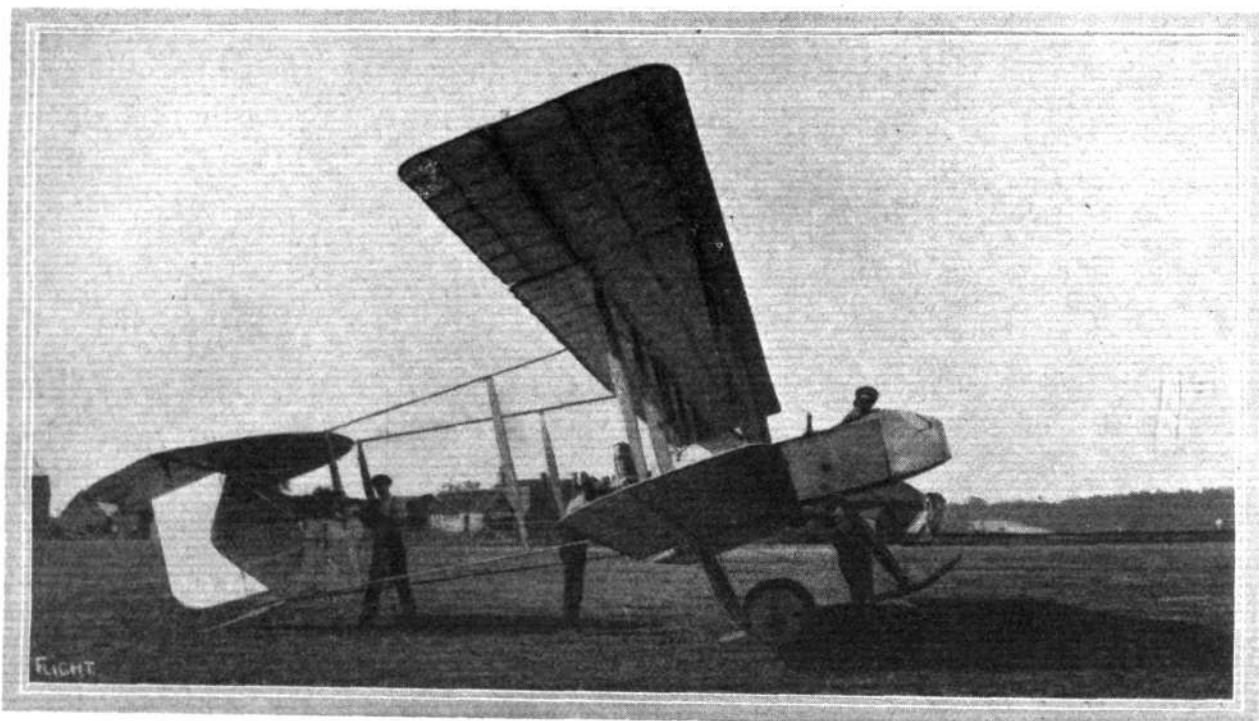
There is very little of importance, specifically relating to the stability of the flying-machine, that has been written, either before or since, that will not be found either in the work of Dr. Bryan (G. H. Bryan, *Stability in Aviation*), or in *Aerial Flight*. A few notes have appeared in the various reports of the Advisory Committee for Aeronautics, but not very much; two short notes of a somewhat trivial character appear in the report of 1909-10, in addition to an excellent abstract of Soreau's *Etat actuel et avenir de l'Aviation*, (*Mémoires, Société des Ingénieurs Civils de France*). In the Reports for 1910-11 and 1911-12 there is nothing; in the Report for 1912-13 there are two or three interesting communications, mainly due to the staff of the National Physical Laboratory, notably memoranda 77, 78 and 79. No. 77 (L. Bairstow, Melville Jones, and A. W. H. Thompson) is, in the main, an examination and extension of existing theory following the methods initiated by Dr. Bryan; No. 78 (L. Bairstow and L. A. MacLachlan) mainly relating to the determination of the various coefficients required for the application of Dr. Bryan's method of treatment. No. 79 (L. Bairstow), dealing with the more detailed application of the same method. These communications are conspicuous by the fact that their authors appear to be really *au courant* with the previous literature of the subject.

(To be continued.)

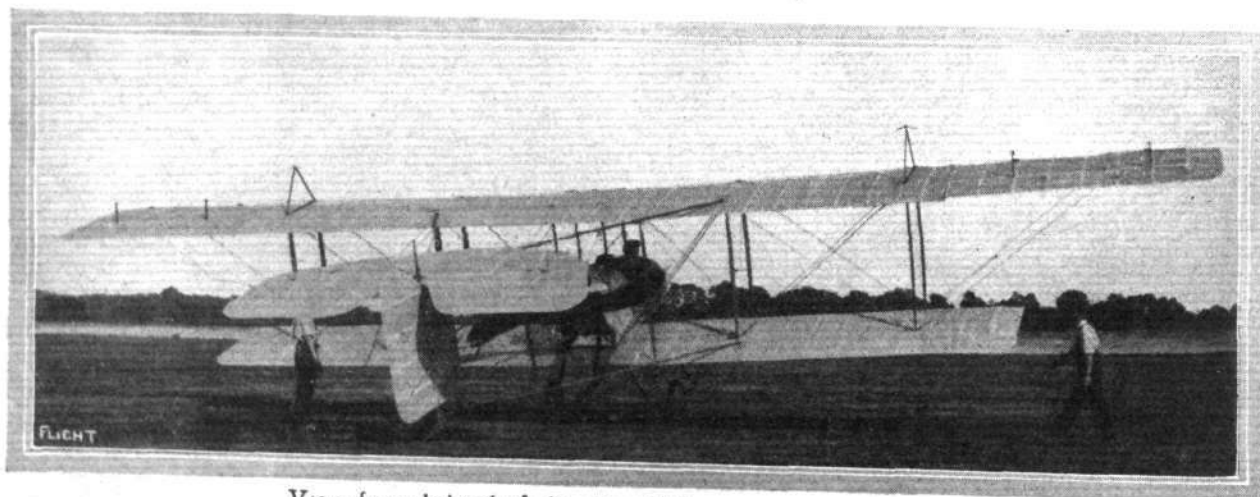
THE NEW VICKERS GUN-CARRYING BIPLANE.



Three-quarter front view.



Side view of the new Vickers gun-carrying biplane.



View from behind of the new Vickers gun-carrying biplane.

THE NEW VICKERS GUN-CARRYING BIPLANE.

A NEW Vickers biplane of the gun-carrying type made its initial appearance at Brooklands last week under weather conditions which were anything but favourable. When Mr. Barnwell took the machine out there was a strong wind blowing, and matters were not improved by the heat eddies set up by the glaring sun. In spite of these disadvantages, however, the machine behaved excellently, and appeared to be well balanced both longitudinally and laterally, Mr. Barnwell commencing to do right- and left-hand turns after once having got the "feel" of the machine. On subsequent flights the engine was switched off in order to test the gliding angle, which appeared to be exceptionally good.

A good idea of the general arrangement of the machine may be gained from the accompanying photographs. The *nacelle*, it will be seen, is comparatively shallow at the nose, thus greatly reducing the side area in front, whilst the rear vertical surface, formed by the

rudder and fixed fin, is of ample proportions, so that there is little doubt that the machine will prove to be spirally stable. The main planes—of which the upper one has a considerable overhang with the weight taken by cables running over king posts—are separated by six pairs of struts. With the exception of the four inner struts, made of steel tubes, which pass through the *nacelle*, all the inter-plane struts as well as the struts in the tail outrigger are of wood.

Four steel tubes, forming a V, as seen in plan, carry the tail planes, and practically all the cross bracing is effected by stranded cable in preference to piano wire. The engine fitted is a 100 h.p. Gnome *monosoupape* driving a Vickers propeller. In its constructional details such as clips and sockets the machine incorporates a number of highly ingenious ideas, and the workmanship throughout the machine is of very high quality.

ROYAL FLYING CORPS.

THE following was announced by the Admiralty on the 2nd inst. :—

Flight-Lieut. A. W. Bigsworth, promoted to the rank of Flight Commander, with seniority of July 1st, and appointed to "President," additional, as Flight Commander for Calshot Naval Air Station.

The following was announced by the Admiralty on the 7th inst. :—

Commander E. A. D. Masterman, to the "President," additional, for Naval Air Department, temporary, to date July 1st.

ROYAL FLYING CORPS (MILITARY WING).

WAR OFFICE summary of work for week ending June 27th :—

Concentration Camp.—Headquarters, Nos. 2, 3, 4, 5 and 6 Squadrons, Aircraft Park and Headquarter Flight.—On Monday, June 22nd, two composite Squadrons took part in the King's Birthday Parade Reviews at Aldershot and Salisbury Plain. The composite Squadrons consisted of flights of the following machines : B.E., Blériot, Sopwith and Henry Farman. In each case the machines and detachments were inspected, and then flew past the saluting point.

The training programme consisted of aircraft and M.T. exercises, speed, climbing and landing tests. Experiments, lectures and discussions were carried out daily during the remainder of the week. The camp was visited on June 26th by the Prime Minister, who was accompanied by Mr. Harold Baker, M.P., Financial Secretary of the War Office. General Hubert Hamilton and several members of the Headquarter Staff of the Southern Command were also present.

The party motored from Andover to one of the temporary landing grounds selected in connection with the aircraft exercise for the day.

The Prime Minister examined various observers' reports, and then watched the machines leave for Netheravon. Motoring on to Netheravon he inspected the sheds and workshops. After luncheon he witnessed flights by various types of machines, and after inspecting No. 2 Squadron, and visiting several barrack blocks, the Institute, and Sergeants' Mess in camp, the party left for Upavon to visit the Central Flying School.

The annual athletic sports were held on June 20th, Headquarters winning the Inter-Squadron Cup.

During the week No. 5 Squadron won the Inter-Squadron Boxing Challenge Cup and No. 2 Squadron the cross-country run. The final of the Inter-Squadron Cricket Cup will be played early next week.

War Office summary of work for week ending July 4th, 1914 :—

Concentration Camp.—The training programme was continued up till Thursday, on which day the Camp broke up. On Monday, June 29th, the Camp was visited by Lord Roberts, the First Lord of the Admiralty, and a party of Military Attachés. After the Aircraft exercise in the morning, Lord Roberts presented cups for the various Inter-Squadron Competitions. In the afternoon a number of machines were paraded, and, ascending at intervals of one minute, flew a circuit of the Plain.

On June 30th the Aircraft exercise consisted of machines searching for a disabled aircraft represented by a balloon. The balloon ascended at 10 o'clock, from an unknown point some 30 miles from Netheravon. The balloon was located by 50 per cent. of the machines, each machine on seeing it having to circle round so that the number on its tail could be seen by the pilot of the balloon. The day was hazy, with the result that the balloon could only be seen at a maximum distance of 8 miles. The altitude of the balloon varied from 2,000 to 5,000 ft.

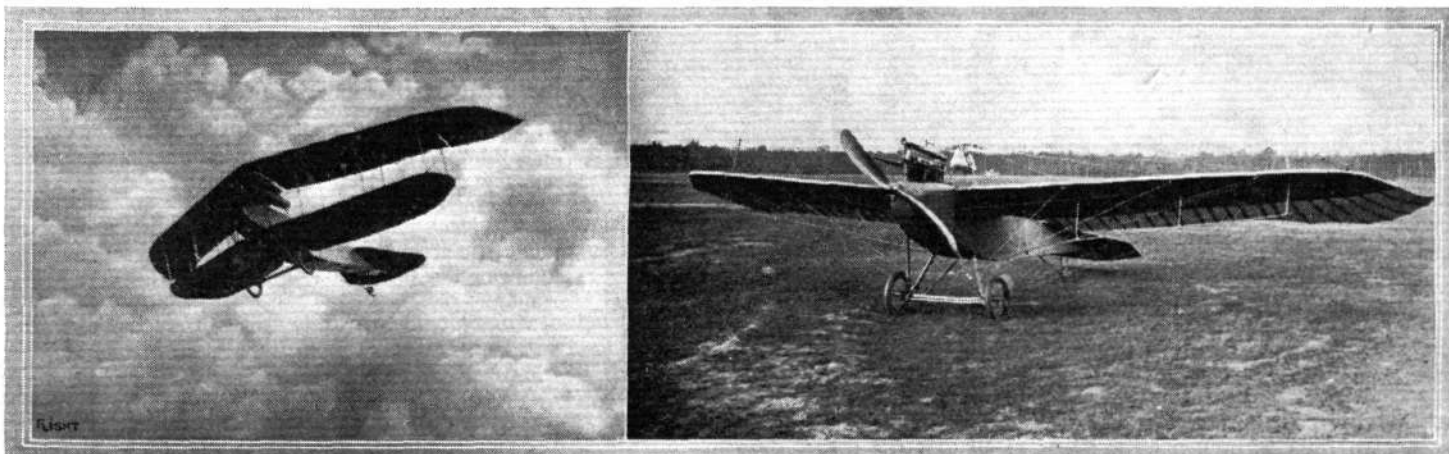
On the morning of the 2nd inst. the Commanding Officer held a final conference attended by all officers. The main features of the work which had been done during June were touched on—the Aircraft and M.T. exercises, speed, climbing and landing tests with machines of various types and ages, experiments, night flying, lectures and discussions. The Concentration has been of much value from many points of view.

The following letter has been received from the War Office :—

"I am to inform you that the Secretary of State for War has expressed his appreciation of the excellent arrangements made for the Concentration of the Military Wing of the Royal Flying Corps at Netheravon, and of the good work which has been carried out by the Corps during the past month."

Headquarters, Headquarter Flight, Aircraft Park and No. 6 Squadron returned to Farnborough on Thursday; Nos. 3 and 4 remain at Netheravon, their permanent station. No. 5 Squadron moves to Fort Grange, Gosport, a new station, on Monday next, and No. 2 will start their journey back to Montrose on the 13th.

The training during the ensuing months leading up to manoeuvres will consist of reconnaissance work with the cavalry, with brigades and divisions, observation of artillery fire, experiments and long cross-country work. The development of the two new Squadrons, Nos. 1 and 7, is being continued at Farnborough.



TWO GERMAN MACHINES WHICH HAVE EXCELLENT PERFORMANCES TO THEIR CREDIT.—Left, the "Roland" biplane, and right, the "Roland" Taube. Both built by the Luft-Fahrzeug-Gesellschaft, Berlin.

FOREIGN AIRCRAFT NEWS.

Garaix Secures Another Record.

AT Chartres on the 2nd inst. Garaix on the Schmitt biplane, fitted with 160 h.p. Rhone motor and Integral propellers, succeeded in regaining for France the duration record for pilot and three passengers which had been held by Gsell with 3 h. 11 m. 30 s. The new record made by Garaix is 4 h. 3 m. 29 s.

Records Made at Vienna Meeting.

THE Austrian Aero Club has decided to apply to the F.A.I. for recognition of three new world's height records made during the Vienna Meeting, which is described on the next page. The new records claimed are:—

Pilot and one passenger, 6,170 metres, by Lieut. Bier.

Pilot and two passengers, 5,440 metres, by Lieut. Bier.

Pilot and three passengers, 4,470 metres, by Von Loeszl.

The Security Competition.

ON the 1st inst. the "Concours de la Sécurité en Aeroplanes" came to an end, and the committee then met to consider the merits of the devices which had been submitted to it. Altogether the committee since the opening of the competition on January 1st, witnessed trials by 21 competitors out of the 56 who had entered. After a very long sitting it was decided, as was anticipated, not to award the Grand Prix of £16,000. Two prizes were awarded, one of £2,000 to the Sperry Gyroscopic Co. and the other of £1,200 to the Paul Schmitt biplane with variable angle of incidence. It was also decided to award seven consolation prizes as follows: £600 to Caudron Brothers for their two-seater biplane, £400 to the Dautre stabiliser, £400 to the Société Avi-Auto for the Lelarge carburettor, £320 for the Eteve stabiliser, £200 to the Moreau monoplane, £80 to the Robert parachute, and £40 to MM. Philippe and Perron for their "démarréur."

Flying from Buc to Malmoe.

STARTING from Buc very early on June 29th, Capt. Sunstedt, on a Henry Farman biplane, accompanied by a passenger, flew to Revener in Holland, and then on to Bremen in Germany. The next morning he was away from Bremen at 6.30 and reached Malmoe in Sweden at 10.45. In a straight line the distance from Buc to Malmoe is about 720 miles.

Rheims to Issy on a Dep.

ON the 3rd inst. Parmelin, on his Gnome-Deperdussin, with his brother as passenger, flew from Rheims to Issy in ten minutes over the hour.

Fine Flying on a Voisin.

SOME fine flying was carried out by Lieut. Levassor, on a Voisin fitted with a 130 h.p. Salmson engine, during last month. Flights were made from Mourmelon to Dunkerque, Lille, Verdun, Nancy, while a non-stop trip from Mourmelon to Poitiers took 4 hrs. 10 mins.



When Werner Landmann, the German pilot, beat the world's duration record on June 29th last by a flight of 21 hrs. 49 mins. duration on his Albatros biplane, he was kept informed of his progress by figures painted in black on an aeroplane wing, as shown in the photograph.

More Purchases by Turkey.

IT is stated in Paris that orders have recently been placed by the Turkish Government for a large number of machines, including a dozen Morane-Saulnier monoplanes and thirty Nieuports.

Nancy to Buc and Back.

THREE biplanes from the military centre at Nancy, piloted by Surgeon Perrin, Sergt. Homeraïn and Sergt. Poincard, on Saturday week went to Buc, and returned *via* Mailly, the round trip of 450 miles being made in 11 hrs. flying time.

Night Flying at Chalons.

SEVERAL trips after dark were made at Chalons Camp on the 1st inst. by Capt. Mauger-Devarenne on his M. Farman biplane. After a solo flight of 20 mins. duration at a height of 700 metres, he made a similar flight with Lieut. Varcin, and then took up Lieut. Personne for half an hour, during which an altitude of 1,100 metres was reached.

Paris to the Sea and Back.

By way of completing the qualifying tests for his military *brevet*, M. Auge, on the 2nd inst., on his Maurice Farman, went from Buc to Deauville and back, while a similar flight was made by Capt. Challes on a Henry Farman machine.

A Joy Ride for M. Farman.

ON Sunday last on one of the latest M. Farman biplanes, Dick Farman took his brother Maurice from Buc for an excursion to Juvisy, then going on to Ville-Sauvage, Dourdan, and back to Buc.

Two French Military Pilots Killed.

AFTER a flight of about four hours over the neighbourhood of Rheims, on the 3rd inst., a military monoplane piloted by Corporal Mirat fell near Betheny. The steering gear appeared to fail when the machine was flying at a height of 250 metres during a heavy shower of rain. The passenger, Corporal Godefroy, was killed in the smash, whilst the pilot only survived his injuries a few hours.

A Fatality in Russia.

WHILE Capt. Bojaroglo was flying in the district of Pskof, on the 1st inst., his machine fell. The pilot was killed on the spot, while the passenger was seriously injured.

Fatal Accidents in Holland and Belgium.

THE Belgian pilot, Liedel, who, as recorded in last week's FLIGHT, was seriously injured in a smash at the Martelange on the 27th ult., succumbed to his injuries later in the week. The first fatal accident in the Dutch Flying Corps occurred on the 2nd inst., at Soesterberg, the day following the celebration of the first anniversary of the establishment of the aerodrome. The machine had only reached a height of 50 metres when apparently something went wrong with the engine and the machine fell. The pilot was so seriously injured that he died in hospital the next morning.

From Berlin to Servia.

IN an attempt to fly from Berlin to Constantinople, Schuler, accompanied by a passenger, on the 1st inst., on a Lloyd biplane, got as far as Palanka, on the Servian-Bulgarian frontier, and then had to come down owing to failure of his petrol supply. The distance covered in a straight line was about 750 miles.

Long Flight in Russia.

— LIEUT. RASSI PEREDOF, with his mechanic, on the 3rd inst., flew the 375 miles from Kieff to Odessa in four hours.

Long Flight in Argentina.

DETAILS are just to hand of a fine flight made in Argentina in the early part of June by Lieut. Goubat on a Rumpler monoplane. Starting from the Palomar military ground near Buenos-Aires, he flew the 320 kiloms. to Canada de Giniez in 3 hrs. and then after replenishing went on to Cordoba, making a total distance of 700 kiloms. He returned on the following day to Canada de Giniez, and, owing to the wind and rain, could not progress any further until the next morning, when he returned to Buenos-Aires in fast time.

"Z 6" Replaces "Z 1" at Cologne.

To take the place of the "Z 1," which owing to its accident a fortnight ago had to be dismantled, the "Z 6" on the 1st inst. left Leipzig at 10.30 p.m., and eight hours later arrived safely at Cologne, where she will be stationed until a new Zeppelin is ready.

THE VIENNA FLYING MEETING.

THE third international flying meeting, which was held at the Aspern Aerodrome, Vienna, from June 21st to 28th, brought together a great number of well-known pilots, representing the following countries: England, France, Russia, Germany, Austria and Hungary, and embracing the following entries of pilots and machines:—

England.—S. V. Sippe (Bristol biplane).

France.—Bathiat (Bathiat-Sanchez monoplane), Chanteloup (2 Caudron biplanes), Poulet (2 Caudron biplanes), Prévost (Deperdussin monoplane), Bielovucic (2 Ponnier monoplanes), Audemars (Morane monoplane), Gilbert (1 Morane mono. and 1 Deperdussin mono.), Chevillard (H. Farman biplane), Garros (Morane monoplane).

Russia.—Slaworossof (Chabardini monoplane).

Germany.—Stöffler (Aviatik biplane), Ingold (Aviatik), Amerigo (Aviatik), Stiploschek (Jeannin Taube), Hirth (Albatros biplane), Loeszl (Albatros biplane), Schulz (A.F.G. biplane).

Austria.—Banfield (M.L.G. biplane), Konschel (M.L.G. monoplane), Sparmann (M.L.G. monoplane), Lilly Steinschneider (M.L.G. mono.), Widmer (Lohner biplane), Wittmann (Lohner), Warchalowski (Lohner), Cihak (3 Cihak monoplanes), Bier (Lloyd biplane).

Hungary.—Schüler (2 Lloyd biplanes).

On the first day of the meeting, June 21st, Garros won the prize for the first out, and looping exhibitions were given by Chanteloup, Chevillard, Garros, Gilbert and Audemars. In the duration competition the German pilot Ingold secured the lead with a flying time of 4 hrs. 7 mins. 2 secs. Stiploschek was second with 3 hrs. 29 mins. 49 secs. The figure eight competition was won by Chevillard, who completed his figure of eight in 16 secs. Chanteloup was second in 17 secs. In the altitude competition Lieut. Bier, who was flying a Lloyd biplane, succeeded in not only beating his rivals but also in establishing a new world's altitude record with three passengers, by climbing to a height of 4,120

metres. The previous record of 3,700 metres was held by Thelen. The speed race on this day was won by Garros.

The second day of the meeting had been postponed from June 24th to June 25th. On this day the prize for the first out was won by Audemars. In the duration competition Stiploschek secured first place, whilst in the "get-off" competition, which required a height of ten metres, with the shortest horizontal run to be reached, Poulet and Chevillard were first with runs of 30 metres, and Gilbert and Chanteloup 3rd and 4th respectively. The climbing contest was won by Gilbert, who reached 1,000 metres in 2 mins. 51 secs. In the altitude competition (with two passengers), Hirth was first (3,920 m.); Audemars second (3,130 m.), and Legagneux third (2,850 m.).

On the third day—June 27th—Bielovucic secured the prize for the first out; the duration contest was won by Stiploschek and the speed race by Gilbert. Audemars had a smash during the speed race, his petrol pipe breaking, the consequent stopping of his engine necessitating a forced landing, during which his machine turned over, fortunately without injury to the pilot. A forced landing contest was won by Chanteloup, who thus again proved the qualities of the Caudron biplane for landing on bad ground. During the day three world's altitude records were established. Lieut. Bier reached a height of 6,170 metres, accompanied by a passenger. Loeszl beat the previous record of 4,120 metres established by Lieut. Bier a few days earlier by going up to an altitude of 4,770 metres accompanied by three passengers. Hirth succeeded in raising the record for pilot and two passengers to 4,900 metres.

June 28th was the last day of the meeting, and on this day the speed race from Aspern to Poysdorf and back was flown, with the result that the three first prizes were divided equally between Garros, Gilbert, and Prévost, whilst the fourth prize was won by Hirth. In the speed race for Austrian competitors, Sparmann was first, Konschel and Wittmann second and third respectively. The "get-off" contest (Austrians only) was won by Konschel, who got his machine up to 10 metres after a run of 75 metres.

THE LATEST "BODDY" LIFE-SAVING JACKET.

SINCE we last described the "Boddy" life-saving jacket—the invention of G. M. Boddy which has been approved by the Board of Trade—several improvements have been introduced. The principal feature of the Boddy jacket is that the supporting medium is "kapok," the down containing the seeds of the Javanese silk-cotton tree. These seeds are in the form of minute air cells coated

with natural oils, which besides having great buoyancy qualities also serve as a protection from the cold. The jacket, which slips over the head, is made up of six pads of "kapok" in strong drill casing, so arranged that two small pads are at the back of the neck, two large ones over the chest and two smaller ones underneath. Two tapes of strong webbing, $1\frac{1}{2}$ ins. wide, are secured to the lower corners of the large front pads and rove through a hem on both sides of the jacket to the back pads so as to tie in front, thus drawing the front pads to the chin and the back ones well on the shoulders and neck. The smaller front pads can also be tied round the body by means of tapes. This arrangement of pads enables the wearer, should he be unconscious or injured, to automatically be turned on his back with his head well out of the water. Another feature of the Boddy jacket is that it is suitable for large or small persons, and can be worn without alteration by men, women, or children. The Boddy life-saving jacket should, in fact, be a necessity on every boat for every human being carried, and should certainly be worn by all aviators when crossing any stretch of water. Several of the pilots taking part in Saturday's air race from Hendon to Paris and back, including W. L. Brock, R. H. Carr, and Louis Noel,

are wearing the Boddy jacket. In conclusion we might mention that one of the great shipping firms has ordered a large supply of these jackets, and that a smaller model is made for the use of bathers, which besides being a great help to those learning to swim, is a means of providing plenty of amusement in the water.



"Flight" Copyright.

Mr. Brock with the Boddy life-saving jacket as worn.

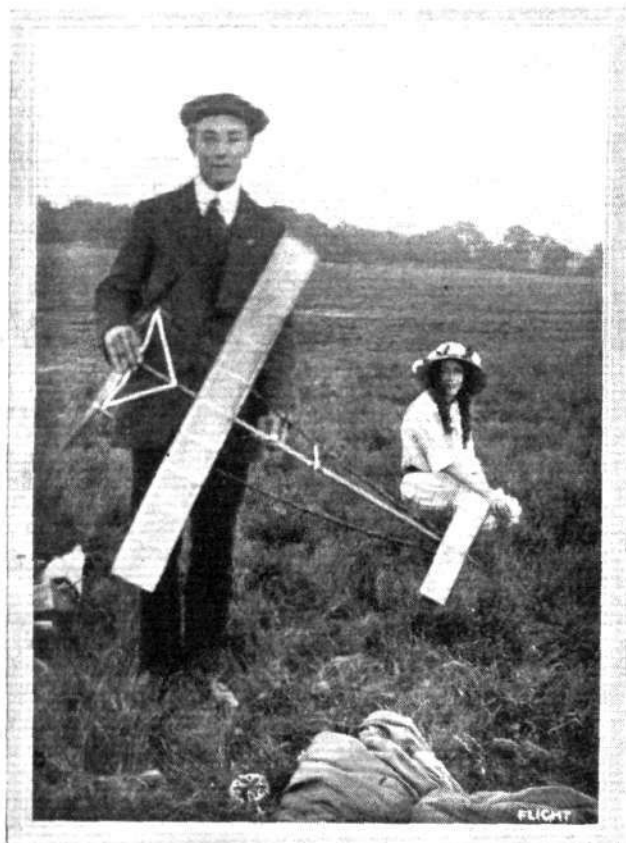


The Lillienthal Memorial which has recently been inaugurated at Gross-Lichterfelde.

Models

Edited by V. E. JOHNSON, M.A.

The Model Engineer Competition. Mr. H. G. Bond's Model.
THE following particulars and accompanying illustration of the winning model in the above competition will, we are sure, not be without interest to the readers of FLIGHT:—Loading, 6.5 ozs. per sq.



Mr. H. G. Bond, the winner of the Model Engineer Competition, and his model.

ft.; length of model, 42 ins.; wing span, 39 ins.; chord, 4.75 ins. Driven by 7 strands of $\frac{1}{4}$ in. strip rubber. Diameter of propellers, 11 ins. Chassis and apex of hard aluminium. B.G. lubricant was used on the rubber motor. Dimensions of elevator, 11 ins. by 3 ins.

Model Drawings.

Mr. G. Morgan, Southampton Street, Ringwood, Hants, would be glad to accept Mr. Wyatt's offer of drawings of his models and of his compressed air motor, recently described in FLIGHT.

Mr. W. G. Billingham's Model Flying Boat as Exhibited at Olympia, 1914.

The boat or fuselage is composed of a framework of silver-spruce 30 ins. long, 2 ins. in width and $1\frac{1}{2}$ ins. deep, covered with silk given a varying number of coats of varnish in accordance with the part where applied.

There are four longitudinals having an uninterrupted run for the whole length of the boat, the upper ones being $\frac{1}{8}$ in. square and the lower ones $\frac{1}{4}$ in. by $\frac{1}{8}$ in. (lying flatwise). There are three steps, spaced equidistant apart, with a distance piece at the rear of each, cut out for lightness. The foremost of these is extended upwards to form the foundation of a dashboard.

Built into the boat is a strong framework to which the planes are attached, which at the same time provides a clearance of $1\frac{1}{4}$ ins. for the planes from the water line.

The planes are set at a positive angle of 3° , and are constructed of 18 gauge steel wire covered with Jap silk and varnished three times.

The dimensions are as follows:—

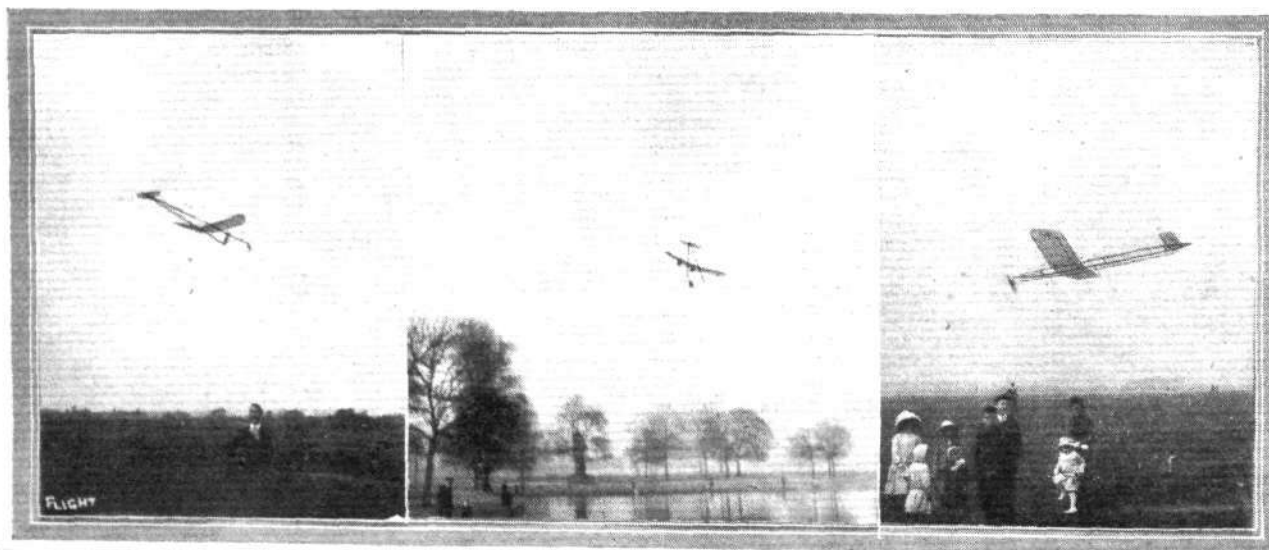
	Span.	Chord.	Max. Camber.
Upper plane	36 ins.	$5\frac{1}{2}$ ins.	$\frac{3}{4}$ in.
Lower plane	24 "	5 "	$\frac{1}{2}$ "
Tail plane	10 "	$5\frac{1}{4}$ "	Nil

The two main planes are separated by eight streamline wood struts, which provide a vertical gap of 6 ins. and a stagger of 2 ins., and are cross-braced with fine straining wire.

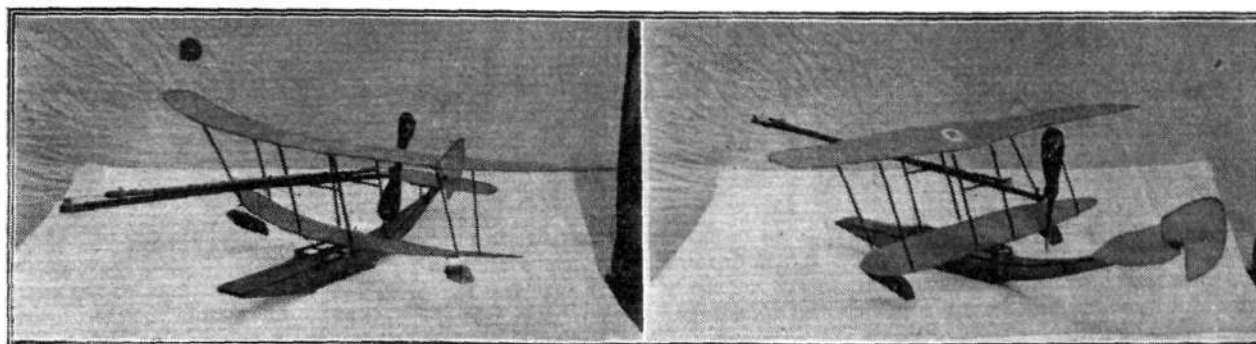
The tail is set at a slight negative angle of incidence, and tends to further enhance the longitudinal stability by means of its action relative to the propeller slip-stream in which it is working. As is obvious in this type of model the centre of thrust is considerably higher up than the centre of gravity and centre of resistance. This being so, immediately the propeller is started the nose of the machine tends to go down, but the slip-stream depresses the tail and so counter-balances that effect. When the propeller stops, and a glide is commenced the weight swings forward, but the tail—now minus the extra depression—rises to bring the model back to its normal flying attitude.

Power is provided by 8 strands of $\frac{1}{4}$ -in. strip rubber carried on a section motor rod 33 inches long, and driving a single 8-in. propeller (by J. Bonn and Co., Ltd.) at 1,500 r.p.m.

The tests of the model have been exceedingly interesting, and many valuable and educational points have been discovered, mainly with regard to the boat. Short hand-launched flights have been obtained, but it has, as yet, refused to quit the water entirely under its own power, although this accomplishment only appears to be a matter of more experiment. On the strength of the information



MR. L. H. SLATTER'S MODELS.—Left, his r.o.g. machine in flight; centre, his hydro-aeroplane flying on Wimbledon Common; and on the right his weight-lifting model in flight.



Two views of the Billinghurst model flying boat.

derived from these tests, I am shortly starting on the construction of a second model of this type, embodying all the latest ideas, &c., which have suggested themselves, and have little doubt of its ultimate success.

* *

KITE AND MODEL AEROPLANE ASSOCIATION.

Official Notices.

British Model Records.

Single screw, hand-launched	Duration	J. E. Louch	95 secs.
Twin screw, do. ...	Distance	R. Lucas	590 yards.
	Duration	G. Hayden	137 secs.
Single screw, rise off ground	Distance	W. E. Evans	290 yards.
	Duration	J. E. Louch	68 secs.
Twin screw, do. ...	Distance	L. H. Slatter	365 yards.
	Duration	J. E. Louch	2 mins. 49 secs.
Single-tractor screw, hand-launched	Distance	C. C. Dutton	266 yards
	Duration	J. E. Louch	91 secs.
Do., off-ground	Distance	C. C. Dutton	190 yards.
	Duration	J. E. Louch	94 secs.
Single screw hydro., off-water	Duration	L. H. Slatter	35 secs.
Single-tractor, do., do.	Duration	C. C. Dutton	29 secs.
Twin screw, do., do.	Duration	L. H. Slatter	60 secs.
Engine driven off grass	Duration	D. Stanger	51 secs.

Inter-Club Contest for the Farrow Shield and Baden-Powell Medals.—This competition took place on July 4th and the following clubs enter the second round on August 22nd, viz.: Paddington, Croydon, Leytonstone, Reigate and Redhill and Aero Models. The contest between Wimbledon and Paddington on the Paddington ground resulted in Paddington winning, and the result may be of interest to model readers. It was as follows:—

WIMBLEDON.						PADDINGTON.					
Team.	1st.	2nd.	3rd.	Total.	Average.	Team.	1st.	2nd.	3rd.	Total.	Average.
T. D. C. Chown	62	55	42	159	53	W. E. Evans	45	2	45	92	30½
D. Easdale	5	73	65	143	47½	C. C. Dutton	5	50	65	120	40
F. W. Powell	89	79	7	175	58½	R. Bird	27	35	58	120	40
G. Hayden	55	38	64	157	52½	D. Driver	42	47	80	169	56½
D. Laing	5	5	33	43	14½	F. W. Johnson	59	34	50	143	47½
A. F. Houlberg	3	7	4	14	4½	H. Wooley	51	35	21	107	35½

The official observers in this competition were Messrs. H. A. Lyche, A.F.K.M.A.A., and M. Levy assisted by the secretaries of the two clubs, Messrs. Chown and Evans.

Competitions.—The Steering Competition and Junior Duration Competition takes place to-morrow (Saturday) afternoon on Wimbledon Common at 3 p.m. All entries for the Baden-Powell Kite Contest must be posted to reach Mr. Lancheater by Saturday, July 11th. Also, all entries for model record trials must reach Mr. Lyche same date.

Official Trials.—The monthly trials take place on Wanstead Flats on July 18th at 3 p.m.

Kite Contest.—The Association's Altitude Challenge Trophy can be competed for on July 18th. For full details see page 7 of programme. It should be noted that in this contest competitors may have assistants, it not being limited to two assistants on account of the work entailed with the winch. It is to be hoped that the well-known fliers Messrs. C. Brogden and B. S. Varnals will be among the competitors for this handsome trophy.

Petrol Engines for Models.—Now that a petrol engine weighing under 3 lbs. has been produced, it is hoped that several modellers will enter for the handsome trophies offered by Sir John and Lady Shelley for models applicable to full-size machines. It is claimed for this new engine that the makers guarantee 2,900 revs., and the makers claim it is the smallest official petrol motor in the world. It is hoped by open competition to prove this is the small motor we have been waiting for. The following is a brief description given by the makers:—"In order to get the greatest simplicity and reliability the two-stroke system was adopted, and the motor has no valves, spring, &c., which reduces liability to breakdown to a minimum. The carburettor can be fitted at any angle by a special device. The oil reservoir mounted on the feed-pipe is transparent to allow the amount of oil to be always visible. The air inlet and the sparking are adjustable." Full details of engine can be obtained from any advertiser in official programme.

Official Badges.—Many members have sent their annual subscription to the gen. hon. sec. of 5s., but their attention is called to the new subscription, which is 6s. and includes the badge. Will all those members remit at once the sum of 1s. 1d. to the sec., so that they may have the official badge of the year sent them without further delay, as it might disqualify them in any competition they might enter, as all members must wear the badge in the competitions?

27, Victory Road, Wimbledon. W. H. AKEHURST, Gen. Hon. Sec.

Should any of your readers wish to view the model, it may interest them to know that it will be on exhibition at the Anglo-American Exposition at the White City, Shepherd's Bush, from May till October.

* *

AFFILIATED MODEL CLUBS DIARY.

CLUB reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Aero-Models Assoc. (30, CORRINGTON RD., GOLDERS GREEN). JULY 11TH, practice for all types, 3 o'clock, Hampstead Garden Suburb Fields.

Leytonstone and District Aero Club (64, LEYSPRING ROAD). JULY 12TH, flying on Wanstead Flats at 6.30 and 10.30 a.m.

Paddington and Districts (77, SWINDERBY ROAD, WEMBLEY). JULY 11TH, competition for single propeller models, minimum weight 4 ozs., minimum loading 4 ozs. per sq. ft. Average duration r.o.g.

UNAFFILIATED CLUBS.

Finsbury Park and District (66, ELFORT ROAD, HIGHBURY, N.). JULY 11TH, flying, Finsbury Park Kite Ground, from 3 p.m.

Ilford Model Ae.C. (83, ENDSLEIGH GARDENS, ILFORD).

JULY 12TH, flying at the Aerodrome, Hog Hill, Hainault Forest, Chigwell Row, 10 a.m. Members are specially requested to meet at the club's temporary workshops on Saturday, July 11th, at 2.15 p.m. to assemble the machines for the Ilford Hospital Carnival.

S. Eastern Model Ae.C. (1, RAILWAY APPROACH, BROCKLEY).

USUAL flying meetings this week-end. July 12th, an important committee meeting will be held on Blackheath.

* * * *

CORRESPONDENCE.

Brakes for Aeroplanes.

[1876] May I further trespass on your valuable space in support of my recent letter on the above subject? Mr. Mair in his letter of last week fails to convince me of the practical utility of the type of brake he suggests. As he remarks, it is common knowledge that the brakes of a moving body should be applied gradually, but as the centre of gravity of an aeroplane is so high compared to the small size of the wheels, it appears, that in order to prevent a nose dive, the application of the brake will of necessity have to be exceptionally slow. In that case, the machine will travel a considerable distance before appreciably losing speed, and so the brake will not fulfil its purpose. It is evident also, that a large force will be required to quickly stop a machine of half a ton weight, moving at 30 m.p.h., and especially as this has to be done by applying brakes to wheels of only seven or eight inches radius.

I cannot fail to think, however, that disaster would soon be encountered by the inexperienced aviator, who, in the excitement of a difficult and forced landing, locked his wheels a second too soon, or applied his brake a little too harshly. Mr. Mair suggests that with an air brake the speed of the machine would actually be increased when landing in a following wind, but possibly he forgets that an aviator seldom alights with a following wind (and especially one of greater velocity than the landing velocity of the machine), as he is well aware of the danger he exposes himself to by so doing.

I do not consider that the time is yet at hand when the effect of brakes on the surface of the ground should be held to be of great importance, as they are mostly needed in cases of emergency, when, I think Mr. Mair will agree, the question of life still claims the whole of our attention. It has been found best, in the case of moving bodies, to apply brakes from behind, and I see no reason why aeroplanes should provide any exception to this custom.

"Mechanic" is by no means the first to suggest a reversible engine with which to apply brakes to a machine, and probably he is unaware of the difficulties that have to be overcome before this can be done. Might I ask how he would reverse his engine against

the torque of the revolving propeller without adding to the weight of the engine? The stability of the machine, of course, would not be affected by reversing the engine, as this would not be done until the aeroplane had touched the ground.

In any case, it is not probable that this type of brake will be employed before the time of more powerful and heavier machines.

HERMAN SHAW.

Royal College of Science, South Kensington, S.W.

Climbing Speeds of Machines.

[1877] With reference to letter 1864 by Mr. Alfred Coate, I should like, with your permission, to state that I am unable to understand why a head or following wind should affect in any way the efficiency of the propeller.

Since the machine is in all cases travelling *en bloc* with the wind, there will, it is clear, be no change in the conditions under which the propeller is working; therefore how can the efficiency of the propeller be changed?

To quote letter 1854, Mr. Coate writes as follows: "But when rising with the wind, the machine will not reach 100 m.p.h." There is no reason whatever why the machine should not reach 100 m.p.h., or wind speed + flying speed. Practical as well as theoretical experience proves this.

If Mr. Coate can prove the accuracy of these statements by any means I should be pleased to alter my opinions.

My reference to the weight of the machine in climbing was extraneous to the argument; I should like to withdraw it until, with your permission, I may prove my statements.

Bedford Park.

S. C. SHEPLEY-PART.

Use of Models in the Development of the Aeroplane.

[1878] I have been much interested in reading your article on Model Aeroplanes in June 19th and 26th issues, and venture to put one or two considerations before you.

It seems to me that if models are to be of any use in the design of full-size machines, it is necessary to work in some particular direction; that is to say, it is of no use merely to build a model which will fly, and which is as nearly as possible a replica of a full-size machine, but it is necessary to set before oneself the particular point to be aimed at in the design. Now the preliminary difficulties are extremely great. Hundreds of experiments are really necessary to arrive at any certain result, and the difficulty of making a model which can be flown hundreds of times without coming to grief, especially if a tractor, is almost insurmountable. A great deal of useful time seems to be wasted in making models which will rise off ordinary grass. Now, a real machine, I should imagine, would hardly start in a hay field before the grass was cut, and this is not an unfair comparison when you consider the shortest turf compared with the model.

The only conditions which can be set to approximate to the real thing are those when rising from the water, and even then something like 25 per cent. of the full available energy of a rubber engine is absorbed in rising, whereas with a real machine, for all practical purposes, the total amount of energy is inexhaustible, and in a flight of 2 or 3 hours the few minutes taken in rising are negligible. The r.o.g. models, then, are really nothing but a toy, and the useful model should be launched either from the smoothest possible of surfaces, or by hand or by mechanical means, so that the useful energy stored up in the engine is used in actual flight, and not in rising.

Further, it is, I should imagine, quite certain that with a rubber engine the exact conditions of a full-size machine cannot be reproduced. Doubtless it may be possible to get the centre of gravity in the same position as in a real machine, but a large portion of the weight must be distributed along the wings even if it is not distributed along the fuselage.

Another difference which it is impossible to overcome is the fact that the torque at the start is so enormously greater than it is at the finish, and seeing that with a given angle of incidence of the planes an increase of power causes the model to rise, there is actually no single moment where the conditions really tally with those of a full-size machine. One must ask oneself the question—What is it one really wants to find out by means of a model? If you would answer this question it would go a long way towards setting modellists to work in the right direction.

There is one point which would be of great assistance, and that is, if, when publishing drawings of models, you would give the position of the centre of gravity. I think I am correct in saying that this has never been given in any of those published within the last 12 months. In my own limited experience I should say that the centre of gravity and the centre of pressure never coincide.

I have recently made a model having two skeins of rubber parallel to the wings, and one parallel to the fuselage, using bevel

wheels, and two propellers turning in opposite directions on the same shaft. My present model is too heavy, and requires a very large amount of rubber, but will fly for a short distance quite steadily and straight. As soon as I have made a second model with the weight considerably cut down and have obtained reasonable success, I will send you up photographs and particulars, as I think it may be of interest, because I have not observed drawings of any similar machine so far in your excellent paper.

Blackhorse Lane, Walthamstow, N.E.

E. N. BRAY.

[Referring to Mr. Bray's interesting letter and the various points which he raises. Whether rising from short grass or from water (if against a breeze) nothing like 25 per cent. of the energy of the rubber is consumed; 5 per cent. would be a far more accurate estimate. At the same time, when flying a model for the sole purpose of making observations during actual free flight, by all means use a special rising surface or launching apparatus, the former for preference. As Mr. Bray says, with a rubber motored model the exact conditions of a full-sized machine cannot be reproduced, and it is in such experiments where this is necessary that the (so-called) powered or engine model scores. We desire to find out, by means of models, anything and everything that might be useful to the cause of aviation. The model laboratory competition to be held later under the auspices of the Aeronautical Society, to ascertain the best lift to drag ratio at a wind speed of 18 miles, will, it is hoped, supply us with some useful data. Any series of experiments, if carefully and scientifically carried out and accurately observed and noted down, might be of great use at some future date. The results arrived at by full-sized workers have not unfrequently been known to aeromodellists some time before. With reference to Mr. Bray's remarks concerning the position of the centre of gravity on models, I have often in the past pointed out in letters to correspondents the necessity for marking plainly the position of the c.g.; it is not unfrequently impossible to answer the query asked because this has not been done.

The only model that I have so far actually seen with two skeins of rubber parallel to the wings was one in which these two skeins were used to drive two horizontally revolving propellers situated at the extremity of the main plane; the model showed remarkable lateral stability, in spite of the increased lateral moment of inertia. I shall be pleased to receive further particulars of our correspondent's model.—V.E.J.]



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Pemberton-Billing, Ltd., Oakbank Wharf, Woolston, Southampton.—Capital £20,000, in £1 shares (10,000 6 per cent. cum. pref., 500 founders', and 9,500 ordinary). Acquiring business of manufacturers and sellers of seaplanes, aeroplanes, and other aircraft carried on by N. Pemberton-Billing, at Southampton. First directors, N. Pemberton-Billing and A. de Broughton.

Rigid Airship Construction Synd., Ltd.—Capital £5,000, in £1 shares. First directors, M. A. Klauck and J. C. Bell.



Aeronautical Patents Published.

Applied for in 1913.

Published July 9th, 1914.

- 8,754. W. LUBBECKE. Framework for aerial vessels.
- 13,650. E. RUMPLER LUFTFAHRZEUGNAU GES. Aeroplane wing.
- 14,537. P. SCHWARZ AND OTHERS. Hydro-aeroplane.
- 21,737. M. M. BOCK. Coverings for balloons, &c.

Applied for in 1914.

Published July 9th, 1914.

- 5,274. LUFTSCHIFFBAU-ZEPPELIN CO. AND DORNIER. Rotary airship sheds.
- 10,517. DAIMLER MOTOREN GES. Aerial craft.

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